G. W. Leibniz

De Summa Rerum

Metaphysical Papers, 1675–1676

Translated with an Introduction

and Notes by G. H. R. Parkinson

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Abbreviations

A = *Gottfried Wilhelm Leibniz: Sämtliche Schriften und Briefe* (Darmstadt and Berlin: Deutsche Akademie der Wissenschaften zu Berlin, 1923–). References to this, the "Academy Edition," specify series, volume, and page, except in the case of Series VI, Vol. 3. As most of the references in this book are to this volume, no mention is made of series and volume in such cases, the page reference being prefixed simply by "A."

C = L. Couturat, ed., *Opuscules et Fragments inédits de Leibniz* (Paris: Alcan, 1903; Reprint ed. Hildesheim: Olms, 1961).

Foucher de Careil = L. A. Foucher de Careil, ed., *Nouvelles Lettres et Opuscules inédits de Leibniz* (Paris: Durand, 1857; Reprint ed. Hildesheim: Olms, 1975).

GM =C. I. Gerhardt, ed., *Leibnizens mathematische Schriften* (Berlin and Halle: Asher and Schmidt, 1849–63. Reprint ed. Hildesheim: Olms, 1971), 7 vols. References are to volume and page.

GP = C. I. Gerhardt, ed., *Die philosophischen Schriften von Gottfried Wilhelm Leibniz* (Berlin: Weidmann, 1875–90. Reprint ed., Hildesheim: Olms, 1960), 7 vols. References are to volume and page.

Grua = G. Grua, ed., *G. W. Leibniz: Textes inédits* (Paris: Presses Universitaires de France, 1948).

VE = Leibniz Forschungsstelle, University of Münster, ed., *Gottfried Wilhelm Leibniz: Vorausedition zur Reihe VI—Philosophische Schriften—in der Ausgabe der Akademie der DDR* (Münster: Leibniz Forschungsstelle, 1982–). This preliminary edition is to appear in ten fascicules, with continuous pagination; at the time of writing (1990) eight have appeared.

A Note on the Text and Translation

Text

The text printed here is that of the Academy edition, Series VI, Vol. 3; but it does not indicate Leibniz's revisions, as the Academy Edition does. The following signs are used in the text: [ ] Restorations by the editors of the Academy Edition of passages where the text is damaged, or where words have been omitted involuntarily; alternatively, alterations made by the editors to the text. ⟨ ⟩ A conjectural restoration of words that are difficult to read, or that have been omitted because of damage to the text.

The editors of the Academy Edition have preserved Leibniz's punctuation. Concerning this, they note that in Leibniz a comma, and more especially a semicolon, often has the function of linking a phrase that precedes a punctuation mark with the predicate that belongs to it.

Translation

The aim has been to produce a translation that keeps close to the text, but is also easily readable. This means that the construction of Leibniz's sentences has had to be altered sometimes. Another difference between text and translation is that Leibniz tends to use underlining where a modern writer would use quotation marks. In such cases, the underlining has been retained in the text in the form of italics, but quotation marks are used in the translation. It should also be added that the dates given in the Introduction and Notes are in accordance with the new style calendar; this was already employed in France when Leibniz was in Paris (1672–76), but was not adopted in Germany until the end of January 1700.

Marginal references are made to the pagination of the Academy Edition in both the texts and the translations. Reference is also made, at the beginning of each piece translated, to the number assigned to it in the Academy Edition.

Introduction

1. The Origins and Significance of the *De Summa Rerum*

At the end of March 1672 Leibniz came to Paris, in the service of the Mainz diplomat Johann Christian von Boineburg who died in December of the same year. Leibniz remained in the French capital for nearly four years more, finally leaving on 4 October 1676 to take up service with Johann Friedrich, Duke of Hanover. For Leibniz, the period that he spent in Paris was one of the most intense and fruitful intellectual activity. Although he had received a thorough university education Germany, universities there at the time were comparatively backward. When he came to Paris, Leibniz had little or no knowledge of recent developments in mathematics;[1] as to philosophy, he admitted that before 1675 his knowledge of Descartes, the leading philosopher of the first half of the seventeenth century, was largely second-hand, based on popular expositions.[2] Paris enabled him to make good these defects. At this time, the city could justly claim to be the intellectual centre of Europe. "Paris," Leibniz wrote to Johann Friedrich in January 1675,[3] "is a place where one can achieve distinction only with difficulty. One finds there, in all branches of knowledge, the most knowledgeable men of the age, and one needs much work and a little determination to establish a reputation there."[4] Determination and the capacity for hard work were two attributes Leibniz had in good measure, and he was soon accepted in intellectual circles which included such eminent mathematicians and philosophers as Huygens, Arnauld, and Malebranche.

Leibniz's chief intellectual endeavours whilst in Paris were in the field of mathematics, culminating in the invention of the calculus in autumn 1675.[5] Although work on mathematics, and also on science and technology, occupied most of his attention during his Paris years,[6] philosophy was not entirely neglected. Not long after his arrival in Paris—more precisely, during the autumn of 1672 and the winter of 1672–73—Leibniz completed an important dialogue on free will, *Confessio Philosophi*.[7] After this, his philosophical interests receded into the background for nearly three years until in December 1675 he began writing a series of philosophical papers, which continued with fair regularity until about April 1676. Like many of his papers, these remained unpublished during his lifetime and long after; it was not until 1913 that most of them were published, in Kazan, by the Russian scholar Ivan Jagodinsky.[8] Following a suggestion made by Leibniz himself,[9] he entitled them, *Leibnitiana. Elementa philosophiae arcanae de summa rerum*. The defects of this edition are notorious;[10] but a reliable version has recently been provided by the Academy Edition of Leibniz, Series VI, Vol. 3, in that part of the volume (Section F) entitled "De Summa Rerum."

The editors of the Academy Edition include under the heading of *De Summa Rerum* more than the philosophical papers that Leibniz wrote between December 1675 and April 1676. Between his departure from Paris early in October 1676 and his arrival in Hanover in mid-December, Leibniz wrote a further series of papers on philosophical topics. The first of these was an extensive work on philosophical problems concerning motion, the dialogue *Pacidius Philalethi,* written between 29 October and 10 November 1676, whilst Leibniz was waiting for a passage from London to Holland. Other philosophical papers followed, some of which are connected with Leibniz's visit to Spinoza in The Hague between 18 and 21 November 1676. All these papers—*Pacidius Philalethi* and the rest—are closely related in themes to the papers of December 1675 to April 1676, and for this reason the editors of the Academy Edition count them as forming part of one group of papers, which they entitle *De Summa Rerum.*

This volume will take account of both the papers of December 1675 to April 1676 and those of October to December 1676, but its scope is limited. These papers fall into two main groups, which overlap in time of composition. One group[11] is concerned with the philosophy of mathematics (in particular with problems of the infinite) and with philosophical problems about the nature of motion. The other deals with philosophical, or more precisely with metaphysical, problems that concern God and the human mind. What are offered here are texts and translations of the most important papers that belong to this second group, as well as selections from some notes on metaphysics that Leibniz wrote on various occasions between March and December 1676.[12] The text used is that of the Academy Edition.

The works presented here are of great importance to the student of Leibniz's philosophy. In effect, they constitute a series of sketches of a metaphysical system—a system, far from immature, which contains many of the doctrines for which Leibniz is best known. This is not to say that all the philosophical doctrines presented in these papers make their first appearance here; but in the *De Summa Rerum* we find Leibniz's first major attempt[13] at presenting his philosophy in a systematic form. There is another reason why these papers are of great interest to the student of Leibniz. In his published works and in his correspondence, Leibniz is very much concerned with the impact that his views will have on his audience; in particular, he is concerned to be neither tedious nor offensive.[14] Speaking of the way in which philosophers should address their public, Leibniz says (A 573): "A metaphysics should be written with accurate definitions and demonstrations, but nothing should be demonstrated in it apart from that which does not clash too much with received opinions. For in that way

this metaphysics can be accepted." In the bulk of the *De Summa Rerum,* however, Leibniz is writing for himself, and the expression of his views is not modified to suit his public.[15]

The *De Summa Rerum,* then, gives us a valuable insight into Leibniz's philosophical thought at an important stage of its development. But it must be said that what is presented to us is not a finished work, but something that is in the process of being worked out. It consists of a series of short essays or notes, some of them only a page long, which Leibniz makes little attempt to connect with one another.[16] Sometimes Leibniz breaks off a discussion before it is properly concluded; sometimes he abandons as inadequate a view which he has put forward previously. Nor is there an orderly sequence of themes. Usually, a paper from the *De Summa Rerum* will deal with several topics,[17] and the reader who tries to follow Leibniz's views about any one topic must pursue it though a number of papers. That being so, the reader who is new to these works needs some guidance, and such guidance might be provided by following a hint that Leibniz drops. We have just seen that he speaks of writing a metaphysics with accurate definitions and demonstrations (A 573), and there are other papers in which Leibniz speaks of putting his work in geometrical form (A 472, 584). One could, then, try to unify the doctrines that are presented in a scattered form in these papers by putting them in the form of a deductive system.[18] Here, however, a method of exposition will be adopted which, although systematic, is not deductive in character. An attempt will also be made to show the importance of these papers in Leibniz's development; this will be done by placing them in a historical context, indicating what is new in them, and which of the ideas that they present are taken up in Leibniz's later philosophy.

But before exposition can begin, a problem of translation has to be dealt with. The question is, what does Leibniz mean when he speaks of a "summa rerum" in these papers? The answer is that the term is ambiguous, but not seriously so. One possible meaning is "the totality of things," that is, "the universe," and indeed Leibniz sometimes uses the term in this sense. For example, in the *Confessio Philosophi* of 1672–73, Leibniz says (A 146) that whatever there is, must be recognised to be the best—provided that one looks at the entire universe ("si summam rerum spectes") and not at this or that part of it. The phrase also seems to have the same meaning in one of the papers translated in this volume. The paper (No. 22 below: A 583, 12 December 1676) has the title "A chain of wonderful demonstrations about the *summa rerum,*" and what follows is a series of propositions about space and time, the vacuum, and fundamental particles. But in a paper of 11 February 1676, a proposal to call a work "De

summa rerum" follows an account of the nature of God (A 475–76), and in this context the phrase is best translated as "On the highest of things," that is, "On the supreme being." In the main, the papers with which this volume is concerned are about the supreme being and his relation to his creatures. In future, then, I will take the words "De summa rerum," when they are used as the title of the papers contained in this volume, to mean "On the supreme being."

2. Philosophy and the Search for Primary Truths

To present the philosophical doctrines of the *De Summa Rerum* in an orderly form, one can hardly do better than begin with Leibniz's answer to the question, "Where ought philosophy to start?" This answer is given in the opening paragraph (A 508) of one of the longer papers in the series, written on 15 April 1676. Leibniz says in effect that philosophy ought to start from "primary truths." Such truths, he says, are truths which cannot be proved, and these fall into three classes:

(i) The proposition "I have such and such appearances."
(ii) The proposition "A is A."
(iii) Definitions.

Leibniz adds that there is a case for starting one's philosophy with a different primary truth, namely, "I think." This, he implies, is the proposition with which Descartes started; the trouble was that Descartes "did not take his analysis to what is deepest, i.e., to primary forms; that is, he did not start from God" (ibid.).

This paragraph states a number of doctrines which are of great importance, not only in the *De Summa Rerum,* but in Leibniz's mature philosophy in general. Proposition (i)[19] is closely related to a thesis which Leibniz had already stated in 1675,[20] and which he held consistently afterwards: namely, that in the case of factual or contingent matters the primary truths concern what we perceive immediately within ourselves. Now what I perceive in this way is both myself, namely, that which is thinking, and also a great variety in my thoughts.[21] This topic will concern us later (Section 5); what concern us here are propositions (ii) and (iii).

In saying that "A is A" is a primary truth, Leibniz is saying in effect that identical propositions are primary truths. Elsewhere in the *De Summa Rerum* (A 506–07) Leibniz explains that by "identical propositions" he means, not only "A is A," but also "A is not not-A,"[22] and there is no reason to believe that he would deny that propositions of the latter form are primary truths. Some years later (in a paper known as *Primae Veritates*) Leibniz was to say that identical propositions, in the sense just defined,

are the primary truths without qualification[23]—though perhaps it would have been more accurate to say that they are the primary truths *of reason,* as opposed to those of type (i), which depend on experience.

The assertion that identical propositions are primary truths raises two questions. First, on what grounds are they said to be *truths?* Second, on what grounds are they said to be *primary* truths? The *De Summa Rerum* contains answers to both these questions. One possible answer to the first might be that the truth of identical propositions is known by some sort of infallible intuition—say, the "clear and distinct perception" of which Descartes spoke. Discussing this view in a note to a paper which he wrote for Spinoza, Leibniz says that it is not good enough to support some assertion by an appeal to experience, saying that one perceives something clearly and distinctly within oneself.[24] Someone who claims to have had an experience of this sort, he says, must tell others how they, too, can have such an experience—and this, he implies, Descartes fails to do.

What, then, justifies us in saying that identical propositions are true? We saw that, in the *De Summa Rerum,* Leibniz understands by "identical propositions" not only propositions of the form "A is A," but also propositions of the form "A is not not-A." To make an assertion of the latter kind is equivalent to saying, "It is false that A is not-A," which is commonly called "the principle of contradiction"; and indeed in his later works Leibniz often yokes together the principle of identity, in the sense of "A is A," and the principle of contradiction, speaking of (for example) "the principle of contradiction, or, what comes to the same, of identity."[25] It is the principle of contradiction which is important in the present context. Leibniz discusses its validation in the *De Summa Rerum,* in a paper of 22 March 1676 (A 396). Taking as an example the proposition that $3 \times 3 = 10$, Leibniz says that someone who asserts this must "use words in a different way from that which . . . [has been] agreed on." Such a person, Leibniz continues, is "willing to state at the same time something and its opposite, which is to destroy the use of words; for in that way it will be legitimate to say whatever one likes." Or again, as Leibniz says in a paper of roughly the same time (A 507: 1st half of April 1676), propositions such as "A is A" and "A is not not-A" must be granted, because if they are not, "speech is undertaken in vain." In sum: the principle of contradiction (or of identity) is a presupposition of rational discourse. The same view was put forward by Leibniz ten years later in a letter to one of his Parisian acquaintances, the Abbé Foucher, who defended a form of Academic scepticism.[26] In this letter, Leibniz discusses the principle of contradiction, in the form of the assertion that "Two contradictories cannot be true, and that what implies a contradiction cannot exist." Defending the princi-

ple, Leibniz says to Foucher that "You yourself assume these when you write and reason; otherwise you could at any moment defend quite the contrary of what you say." The principle of contradiction, then, must be accepted by every "serious seeker after truth."[27]

We come now to the second question: namely, why identical propositions should be regarded, not just as truths, but as *primary* truths. The answer may seem obvious. Leibniz has said that a primary truth is one that cannot be proved (A 508, quoted at the beginning of this section); now, a proposition of the form "A is A" or "A is not not-A" is a truth that cannot be proved. But there is a complexity here. As we have seen, Leibniz believes that it is possible to *argue for* the principle of identity. The point is, however, that such an argument does not involve the *deduction* of the proposition in question from some other proposition or propositions. A primary truth, in other words, is one that cannot be deduced, or, as Leibniz would say, "demonstrated." One now asks: what, according to Leibniz, is it to deduce something? It is here that group (iii) of the primary propositions listed at the beginning of this section plays its part.

This group, it will be remembered, consists of definitions. In his later writings, Leibniz does not regard definitions as primary truths;[28] he may regard them as such in the *De Summa Rerum* in that (like the other kinds of primary truths) they cannot be demonstrated. Leaving that aside: what is important about definitions is the part that they play in deductive arguments. This is recognised in the *De Summa Rerum,* where Leibniz says that propositions which are necessary but not identical can be "shown" (that is, demonstrated) by the help of identical propositions "together with definitions or analyses" (A 575: November 1676?). In other words: to demonstrate a proposition is to reduce it to an identical proposition by substituting definitions for defined terms.[29] This continued to be Leibniz's view: for example, in a paper on freedom written in about 1689[30] he says, "Demonstration consists simply in this: by the analysis of the terms of a proposition, and by substituting for a defined term a definition or part of a definition, one shows a certain equation or coincidence of predicate with subject in a reciprocal proposition."[31]

What Leibniz says about the importance of definitions in the context of demonstration is by no means new with the *De Summa Rerum.* In one of his earliest philosophical works, the *De Arte Combinatoria* (1666), Leibniz says (A VI.1, 199) that definition has one "locus" or "topic," definition; he explained this by saying later, in letters and papers written in 1671 and 1672, that a demonstration is simply a combination of definitions.[32] What does seem to be new with the *De Summa Rerum,* however, is something that Leibniz says in connection with a problem that definitions

raise. The problem is one that concerns, not so much the truth, as the very significance of what is said, and will therefore be discussed in a new section.

3. Ideas, Possibility, and God

To introduce the problem, one must start from something that Leibniz says about the nature of definition: namely, that a definition is stated in words, or in other symbols. This is made clear in the first of the papers that constitute the *De Summa Rerum,* in which it is stated (A 463) that a definition is an aggregate of words. Leibniz had already put forward this view, and he continued to do so in later works.[33] The problem that arises may be stated in the form in which it is expressed in the *De Summa Rerum.* It is one thing, Leibniz says there, to proceed by means of definitions or symbols, and quite another to proceed by means of ideas (A 462). The point that he is making is this. To provide a demonstration is to *think,* and thinking is done by means of ideas. Definitions have their uses, in that they enable us to fix our thought, so that it can be readily accessible both to ourselves and to others (ibid.), but we do not think in words or symbols. These *stand for* the units of thought, which Leibniz here regards as ideas. In his later works, Leibniz took a similar view about the relation between thought and words, though he said then that a meaningful word (or more precisely, a noun) is the sign of a *concept.*[34]

In the *De Summa Rerum,* Leibniz uses a specific example to indicate the problem that definitions involve (A 462). He takes the phrase, "that than which a greater cannot be thought." He does not connect this explicitly with the topic of definition, but doubtless he has in mind the fact that this was one way of defining God.[35] Now, we have ideas of the individual components of this phrase, that is, we have ideas of greater, of thought, and so on. These ideas Leibniz calls ideas of "simples." He then argues that we have these ideas successively, and do not join them to one another. Later, however, I may join together the words or symbols that stand for these ideas, and when I do so I imagine that I have the idea of that than which a greater cannot be thought. But in this, I deceive myself; the fact is that I am *not* thinking of all of them at the same time. The only being that can form such an idea is God, who can think of many things—indeed, of all things (A 463)—at the same time. The same point, Leibniz says (A 462–63), can be made in terms of possibility. That is, instead of saying that we have no idea of that than which a greater cannot be thought, we could say that we are not entitled to assert, merely on the basis of our ideas of simples, that such a being is possible.

Leibniz continued to think it of the greatest importance to try to estab-

lish when we have genuine ideas, or, when that of which we imagine ourselves to think is even possible. That is, for example, one of the topics discussed in his *Meditationes de Cognitione, Veritate et Ideis* (GP IV, 422–26), an important paper published in 1684. But the line of argument just described, based on the supposedly successive nature of our thought of what is complex, was not one which he continued to follow. A major weakness in his exposition of the argument in the first paper of the *De Summa Rerum* is his failure to give any definition of the term "idea." Not long after writing this paper, Leibniz made some notes on Foucher's critique of the second volume of Malebranche's *Recherche de la vérité*,[36] and in them he pointed out that the word "idea" is ambiguous. He noted (A 315–16) that in one sense an idea can be taken to be a quality or form of thought, a "manner of being" of our mind. But an idea can also be taken to be "the immediate or proximate object of perception," such that when we think of (for example) being, identity, thought, or duration, what we think of is an idea. In effect, Leibniz is here distinguishing between an idea as a psychological entity of some kind (the first sense) and an idea as a concept. Such is the distinction which Leibniz draws in his notes on Foucher; in the present paper (A 462–63), he appears to use the term "idea" in both senses, without distinguishing clearly between them. He says that we "have" ideas (A 462) and that certain ideas are "in us" (A 463), which suggests the first sense of the term. But he also suggests that an idea is a concept, when he speaks successively (A 463) of the absence of any idea of a number of all numbers, and of the impossibility of the concept of a most rapid motion.[37]

Leibniz seems to have come to see that the real point at issue, when the genuineness of ideas is in question, has nothing to do with psychology; it has nothing to do with the alleged fact that human beings cannot, at one and the same time, think about anything that is complex. Rather, the problem concerns concepts, and more specifically the self-consistency of concepts. Take, for example, the phrase quoted earlier—"that than which a greater cannot be thought." Leibniz would ask whether there is an idea that corresponds to this phrase, by which he would mean: is there a self-consistent concept of that than which a greater cannot be thought? In other words, is such a being even possible, or would it be self-contradictory to suppose the existence of such a being, as it would be self-contradictory (A 463) to suppose that there is a number of all numbers, or a most rapid motion?

It was mentioned earlier that "that than which a greater cannot be thought" was one way of defining God; and in fact when Leibniz considers the establishment of possibility in the *De Summa Rerum*, it is above all the

possibility of God with which he is concerned. This is hardly surprising, in that the main theme of the papers is the supreme being. But it may seem surprising that Leibniz should be so concerned with the *possibility* of a supreme being; for it may be thought that theologians want to establish that God exists, and not just that God is a possibility. Leibniz would reply that he, too, is concerned to establish the existence of God. But, he would say, if one wants to argue for the existence of God on the basis of a concept of God (as some do), one must first make sure that this concept is self-consistent, and that God is at any rate a possible being. What we are concerned with here is the so-called "ontological" argument for the existence of God, which had been formulated by St. Anselm and by Descartes, as well as by Spinoza, whose philosophy Leibniz discussed with their mutual acquaintance Tschirnhaus in the winter of 1675–76 (A 380, 384–85). Leibniz has much to say about this argument in the *De Summa Rerum,* and it will be worth while to survey the account that he gives of it.

One may take the term "ontological argument," in a broad sense, to refer to any argument which proceeds from the definition or concept of God to the existence of God. But it is important to realise that there are two versions of this argument. The first is that offered by Descartes, with which Leibniz associated the argument offered by St. Anselm. Anselm's argument (which Leibniz mentions by way of Aquinas' criticism of it: A 510–11) is based on the definition of God as that than which nothing greater can be thought. Leibniz takes this to be the same as the argument advanced by Descartes, based on the concept of a most perfect being, and it is Descartes' formulation that Leibniz discusses.[38] The argument is familiar: the most perfect being must, by definition, contain all perfections; but existence is a perfection, therefore the most perfect being must exist. Leibniz says that if the argument is to be accepted (and, basically, the argument is sound) then we must be able to show that a most perfect being is possible, that is, that its concept does not contain a contradiction. For, as Leibniz explains in some of his later works,[39] if the concept is self-contradictory, then we can infer from it both that the most perfect being exists and that it does not exist.

In the *De Summa Rerum,* Leibniz makes the claim (A 395, 22 March 1676) that he was "perhaps the first to have shown" that a most perfect being is possible, and it appears that his argument to this effect is new with the work. The argument, which is expressed in a number of drafts which culminate in a paper submitted to Spinoza between 18 and 21 November 1676,[40] can easily be followed in Leibniz's expositions of it, and needs little comment here.[41] Two points may be mentioned, however. The first is that Leibniz's argument is not, ostensibly, phrased in terms of *concepts*.

Leibniz defines a perfection as "every simple quality which is positive and absolute" (A 578), and his argument is that all these qualities are compatible, that is, can exist in one and the same being. He does not say expressly that the concepts of the various perfections are compatible, so that there is a genuine concept of a most perfect being. However, there is no inconsistency here; Leibniz makes it clear in a note to the paper submitted to Spinoza (A 579) that to say that a most perfect being is possible is to say that there is a "notion" (sc. a concept) of such a being. The second point concerns the place of the argument in the history of Leibniz's thought. What is presented here is an argument that Leibniz continued to think sound; there are brief expositions of it in some definitions of metaphysical concepts written in about 1685,[42] and in section 45 of the *Monadology* of 1714.

The second version of the ontological argument is based on the definition of God as a necessary being—that is, as a being to whose essence existence belongs. Such an argument is offered by Spinoza in the *Ethics;*[43] there may also be a hint of it in a paper which Leibniz wrote on 15 April 1676, in which he says (A 511) that it is necessary to show the possibility of that which cannot not exist (sc. a necessary being), and also of a greatest or most perfect being. It is certainly expressed in papers written probably in November and December 1676 (A 576, 582–83). The argument is that a necessary being is one from whose essence existence follows (or, is one whose non-existence would involve a contradiction), from which it follows that a necessary being necessarily exists. But whatever necessarily exists, exists (A 576).

Leibniz later said that this argument is preferable to the one based on the perfections of God, in that it can be expressed more concisely and is free from obscure phrases (*ambagibus*) about the perfections of God.[44] But just as the possibility of a most perfect being must be established, so too must the possibility of a necessary being.[45] In a note to a paper written on 11 February 1676 (A 472), Leibniz offers an argument for the possibility of such a being. The argument seems to be based on another argument for the existence of God, namely the cosmological argument. Leibniz argues that since something exists, and since everything has a cause, then there must exist a necessary being; but since a necessary being exists, then (arguing from *esse* to *posse*) such a being must be possible. Leibniz does not seem to have used this argument elsewhere; and indeed it would appear that, if valid, it is also superfluous. For Leibniz is in effect proposing to use the existence of a necessary being to prove that such a being is possible—so that he can prove that it exists. It is perhaps significant that

Leibniz said later (April 1677) that although he believed that such a proof could be given, no one had yet provided it.[46]

Before we leave these two versions of the ontological argument for the existence of God, there is an important question to be considered. The question is this: even if we assume these arguments to be valid, would they establish the existence of God, in any standard sense of the term "God"? What precisely are the perfections of the most perfect being? All that we know of them so far is that they are simple, positive, and absolute qualities; but are they the perfections that would commonly be ascribed to God? The same can be said about Leibniz's argument for the existence of a necessary being. How can Leibniz get from such a being to a being of the kind that would commonly be called "God"? Although Leibniz does not discuss these matters explicitly in the *De Summa Rerum,* there are indications of the way in which he would have discussed them. It must be emphasised at the outset that Leibniz believes that the most perfect being, or the necessary being, is the God who is recognised by theists; there is no hint of (say) any crypto-Spinozism. He says expressly that God is not nature, or necessity, or the world; rather, "God is a certain substance, a person, a mind" (A 475). And not only is God a mind; God is a most wise and most powerful king, whose subjects are minds (A 476). Precisely what, then, are the perfections of God, and how does Leibniz argue for them?

In effect, he bases his argument on the following principle (A 520): any affirmative form (sc. any perfection) which is present in finite things in a limited way is also present in an absolute way in the most perfect being.[47] This is not a mere *ad hoc* principle; Leibniz could claim that it is true by virtue of the very meaning of terms, in that a term is called "positive and absolute" if it expresses, without any limits, whatever it does express (A 577–78). Much later, Leibniz put the same point in Scholastic terminology, when he said (*Principes de la Nature et de la Grâce,* 1714, sec. 9; GP VI, 602) that the perfections of created substances are contained "more eminently" in God.[48]

In the *De Summa Rerum,* Leibniz uses this principle to derive a number of God's attributes: immeasurability (*immensitas*),[49] eternity, omnipotence, perfection, and omniscience (A 520). It is strange that Leibniz should list perfection (namely, absolute existence) as one of God's perfections; this would have the consequence that perfection is one of the perfections of God. It is perhaps significant that in another passage in which Leibniz discusses the perfections of God, he mentions only omniscience, immeasurability, omnipotence, and eternity (391–92).[50] It is also surpris-

ing that Leibniz does not mention God's goodness as one of his perfections. A more serious deficiency, however, is the absence of an answer to the question why certain qualities in particular, out of the enormous number of qualities that finite beings have, should be singled out and used as the basis of an argument for God's perfections.[51]

We come now to the question, whether the necessary being can properly be called "God." What Leibniz has to say about this in the *De Summa Rerum* is very sketchy. He begins by saying (A 587) that a necessary being acts on itself; his reason for saying this may be that a necessary being is also a cause of itself.[52] But (he continues) to say that the necessary being acts on itself is to say that it *thinks;* for to think is simply to sense oneself.[53] From this, Leibniz goes on to say that a necessary being acts through the simplest means,[54] perhaps on the grounds that to do so is a mark of the highest intelligence. This seems to be all that Leibniz has to say about the subject. One is left with the impression that, despite Leibniz's stated preference for the argument from the concept of a necessary being, it is the argument from the concept of a most perfect being that is more likely to give him what he wants.

4. The Principles of Contradiction, Sufficient Reason, and Harmony

In his later works, Leibniz often expressed the view that our reasoning is based on two main principles—those of contradiction and of sufficient reason. The first is stated in many ways, but one may take as typical the formulation offered in the *Monadology,* sec. 31 (1714: GP VI, 612): namely, that the principle of contradiction is that "by virtue of which we judge to be false that which involves a contradiction, and true that which is opposed to or contradictory of the false."[55] We have seen already (Section 2, n.25) that in his later works Leibniz suggests that the principle of contradiction can also be called the principle of identity; for example, he speaks of "the principles of contradiction or identity," saying that this principle states, not only that A cannot be not-A, but also that A is A.[56] It is on the principle of contradiction that necessary truths, such as those of mathematics, are based.[57]

Leibniz does not mention the term, "principle of contradiction," in the *De Summa Rerum,* but he certainly refers to, and uses, the principle itself. As was pointed out in Section 2, he regards as a primary truth the proposition that A is A (A 508), and with "A is A" he also links "A is not not-A" (A 506–07); he also says (A 508) that every identical proposition is true. He also implies a close connection between the principle of contradiction and necessary truths, saying (A 575) that necessary indemonstrable prop-

ositions are identical, and that all other (necessary) truths can be proved by means of them, together with the help of definitions.[58] He does not, however, say expressly in the *De Summa Rerum* that a necessary truth is one whose opposite involves a contradiction, though this was already his view,[59] and continued to be so.[60] It should also be noted that the principle of contradiction is not simply referred to in the *De Summa Rerum,* but is also used in the establishment of Leibniz's metaphysics; for the ontological argument rests on the thesis that it is self-contradictory (and therefore false) to deny the existence of a most perfect being, or of a necessary being.

Like the principle of contradiction, the principle of sufficient reason is stated by Leibniz in a variety of ways.[61] Perhaps the best-known formulation is that contained in sec. 32 of the *Monadology* (1714: GP VI, 612). It is by virtue of this principle, Leibniz says, that "there can be no real or existing fact, no true proposition, without there being a sufficient reason why it should be so and not otherwise, though in most cases these reasons cannot be known to us." Leibniz often formulates what is evidently the same principle without the use of the adjective "sufficient," speaking for example of the principle that "Nothing happens without a reason" (to Arnauld, 14 July 1686, GP II, 56), or of the principle that nothing happens without a cause (for example, *De verum a falso diagnoscendi criteriis,* 1685–87? [GP VII, 301; cf. VE Fasc. 6, p. 1172]).

Leibniz does not use the term "principle of sufficient reason" in the *De Summa Rerum,* but he states the principle there in the form of the assertion (A 587) that "There is nothing without a reason," and that (A 584) "There is nothing without a cause." The term "sufficient reason" can be found in previous works,[62] and there is a particularly interesting discussion of the principle in a paper known as *Demonstratio propositionum primarum,* autumn 1671–beginning of 1672? (A VI.2, 483). In the course of this paper, Leibniz offers a demonstration of the proposition, "There is nothing without a reason, or, whatever exists has a sufficient reason." He begins by defining a "sufficient reason" as "that which, being given, the thing exists" and a "requisite" as "that which, not being given, the thing does not exist." He then argues that whatever exists, has all its requisites; for if one were not given, then (by the definition of "requisite") the thing would not exist. He then says that, given all its requisites, a thing exists (for if it did not exist, one of its requisites would be missing); therefore (by the definition of "sufficient reason") all the requisites of a thing constitute a sufficient reason; therefore whatever exists has a sufficient reason.

This proof can also be found in a less formal guise in the *De Summa Rerum* (A 584, 587). It is interesting in two respects. First, it shows clearly

that Leibniz means by a "sufficient reason" what would now be called a "sufficient condition," and that he views the sufficient reason of something as the sum of all its "requisites"; that is, as the sum of what would now be called its "necessary conditions." The second interesting feature of the argument is that it is a formal proof; Leibniz does not regard the principle of sufficient reason as an indemonstrable truth, like the principle of contradiction or identity. In his later philosophical works, Leibniz continued to regard the principle of sufficient reason as a proposition which can be proved, but the proof that he offered was different. As he put it in an appendix to the *Théodicée* (1710: GP VI, 414) the principle of sufficient reason is "contained in the definition of truth and falsity." The argument (familiar from the *Discours de Métaphysique* and the correspondence with Arnauld)[63] rests on Leibniz's celebrated view that in every true proposition the concept of the predicate is contained in that of the subject. Now, to prove that a proposition is true is to show *how* the concept of the predicate is contained in that of the subject (or, it is to reduce the proposition that is to be proved to an identical proposition); therefore every true proposition can be proved, that is, there is a sufficient reason for its truth. This line of argument is not present in the *De Summa Rerum*. Leibniz says there only that, given all its requisites, a thing exists; he does not suggest that these requisites are in a way built into the concept of the thing.

According to Leibniz, the principle of sufficient reason is universal in its application; it tells us that nothing whatsoever is in principle inexplicable. But Leibniz also uses the principle, not just to say that one must always look for a reason,[64] but also to establish specific metaphysical propositions, both about the world and its creator. Leibniz's metaphysical theses about the world will be discussed in later sections; but it will be useful to give some account in this section of the way in which the principle of sufficient reason is used by Leibniz in an argument for the existence of God which supplements the ontological argument, discussed in the last section.

The argument may seem to be a very old one—just the familiar "cosmological" or "first cause" argument for the existence of God. But there is a subtlety in Leibniz's version of the argument. In what is perhaps its most familiar form, the cosmological argument states that there cannot be an infinite regress of causes; it asserts what Kant called "the impossibility of an infinite series of causes, given one after the other, in the sensible world."[65] Leibniz's argument does not assert any such impossibility. In the *De Summa Rerum* (A 587: December 1676?) he argues that there must be an ultimate cause of the series of bodies, and that this cause cannot be a body. But he does not base his argument on the thesis that an infinite

succession of bodies is impossible. Rather he says that, even if one supposes such a succession, the principle of sufficient reason is not satisfied; for "even if you go back to infinity, you will only multiply bodies; but you will not understand the reason why it should be so and not otherwise." This argument is similar to one put forward by Spinoza in a letter of 1663 (Ep. 12), which was communicated to Leibniz early in 1676 by their mutual acquaintance Schuller and of which Leibniz expressed approval (A 282, n.25: February 1676?). Leibniz did not derive the argument from Spinoza; for an argument very similar to it is to be found in one of the Leibniz's earliest works, the *Confessio Naturae contra Atheistas* of 1669 (A VI.1, 490; GP IV, 106–07).[66] Leibniz continued to think the argument sound; it is to be found, for example, in his *De Rerum Originatione Radicali,* published in 1697.[67]

In the argument contained in the *De Summa Rerum,* Leibniz continues by saying that what is true of bodies is true of all things which do not exist necessarily—that is, the reason for whose existence is not in themselves. The ultimate cause, on the other hand, does exist necessarily—is a necessary being. To complete the argument, Leibniz ought to have shown that there is only one necessary being, but in the passage under consideration (A 587) he does not attempt this; he merely asserts that there is only one such being. An argument for this conclusion, however, was already available to him, for in the *Confessio Naturae contra Atheistas* he had argued for the uniqueness of the ultimate cause of motion on the basis of "the harmony of all things among themselves."[68]

We come now to the last of the three principles to be considered in this section. In his later philosophy, Leibniz makes much use of a principle which he calls "the principle of the best."[69] This may be regarded as a specific form of the principle of sufficient reason; specific, in that it concerns contingent things and truths only, whereas the principle of sufficient reason is universal in its application,[70] and also in that the "sufficient reason" is one that determines God's choice in creating the universe. The principle may be formulated as follows: contingent things exist as they do because God chose to create them, and God's choice is determined by the knowledge of what is best. In the *De Summa Rerum,* Leibniz makes no explicit reference to a "principle of the best"; but he does say that "For things to exist is the same as for them to be understood by God to be the best" (A 588), and "To exist . . . is simply to be understood to be good" (A 512). One might think that Leibniz should have said, not only that God *understands* that the existence of certain things is best, but that he also *wills* that they should exist. Leibniz explains (A 512) that if God understands something to be the best, then

he also wills it. One may say, then, that the *De Summa Rerum* recognises the principle of the best. As a rule, Leibniz says in this work that God's choices are to be explained, not by the good or the best, but by reference to harmony. So, for example, in the passage just cited from A 588 Leibniz follows the term "the best" with the phrase "i.e., the most harmonious," and in A 474 he says that "To exist . . . is to be harmonious." It will be convenient, then, to say that according to the *De Summa Rerum,* God's choices are determined by a "principle of harmony," even though Leibniz does not actually use this term. Why Leibniz should prefer to speak of "harmony" will become clear later; for the moment, it may be noted that language of this kind is not new with the *De Summa Rerum,*[71] nor does its use end with that work; as late as the *Nouveaux Essais,* 1703–04 (3.6.12) Leibniz says that he believes that "there exist in the universe all the things that its perfect harmony could admit." What is distinctive about the use of the principle of harmony in the *De Summa Rerum* is that it functions there as a key concept.

As has just been seen, the principle of harmony is one that determines the will of God. To grasp exactly what the principle means, and why Leibniz should think it to be true, it will be best to consider the place of the will of God in Leibniz's metaphysical system. Leibniz does not discuss the issue systematically in the *De Summa Rerum,* but he says enough for his line of argument to be reconstructed. We may begin with a passage from a paper written on 12 December 1676. In this passage (A 581–82) Leibniz makes the point that not all possibles exist; for something may be possible in itself, but not "compossible" with others. This point is of fundamental importance in Leibniz's philosophy; it was to be developed in his concept of "possible worlds," and is at the centre of his reply to those philosophers who held that whatever exists, exists with logical necessity.[72] In the passage just cited, Leibniz goes on to say that if all possibles were to exist, then "there would be no need of a reason for existing, and mere possibility would be enough" (A 582). This means, he says, that there would not be a God—or at any rate, a God of the kind "in whom the pious believe," that is, a God of the kind believed in by theists; for everything would be logically necessary. However, the view of the necessitarians is false; the fact that there is some x which is possible but does not exist refutes the thesis that, whatever x may be, if x is possible then x exists. From this point, the argument appears to proceed as follows. By the principle of sufficient reason, there must be a reason why certain things exist rather than others, and Leibniz takes this reason to be the will of God—for a free act of the will allows for unfulfilled possibilities. But God's will, too, must have a reason, and God, as the most perfect being,

wills to exist that which he understands to be "the best, i.e., the most harmonious" (A 588, quoted above).

It remains to be seen what Leibniz means by the term "harmony." One of the ways that he defines it in the *De Summa Rerum* is as "a certain simplicity in multiplicity" (A 588). This is in line with what he had said before: for example, that harmony is "diversity compensated by identity"[73] or that it is "unity in many."[74] This, however, is somewhat vague; Leibniz is more precise when he says in the *De Summa Rerum* (A 472, 11 February 1676) that the principle of the harmony of things is that "the greatest amount of essence that can exist, does exist."[75] Even this is not quite exact; for a precise answer we have to go to A 466 (December 1675), in which Leibniz says that to speak of the harmony of the works of God is to say that "the wisest being chooses the simplest means to achieve the greatest results." The same passage indicates why God should choose in this way; namely, because supreme wisdom is one of his perfections (cf. Section 3, p. xxi above). In this form, the principle of harmony appears to be new with the *De Summa Rerum,* but it is by no means peculiar to it; Leibniz continued to take the view that God produces "the greatest effect . . . with . . . the least expenditure."[76]

5. Material Things: A Phenomenalist Analysis

The chief task of the rest of this introduction is to expound the way in which, in the *De Summa Rerum,* Leibniz uses the principles just discussed (and some others) to argue for propositions about the nature of the world that God has created. First, however, we must consider Leibniz's reasons for thinking that there exists a world, in the sense of things that are other than God. A paper from the *De Summa Rerum* dated 15 April 1676 is of particular importance here. A starting point is provided by the first of the "primary truths" listed in this paper, and already mentioned in Section 2 (p. xiv): namely, the proposition that "I have such and such appearances" (A 508). The paragraph that contains this assertion repays careful analysis.

Although Descartes is criticised later in this paragraph, Leibniz is in tacit agreement with him that we cannot claim to have immediate sense-given knowledge of the existence and nature of material things. The immediate knowledge with which the senses provide us is not of things, it is of the appearances of things. This is why Leibniz says that one of the primary truths is that he "has" such and such appearances, and why he speaks (in a letter to Foucher of 1675) of "our" appearances (A II.1, 248; GP I, 372)—that is to say, appearances which belong to us. Leibniz also speaks, not of the *having* but of the *perception* of appearances, and appar-

ently does not distinguish between the two.[77] He then goes on to say that from his perception of appearances it follows that he himself exists—a thesis for which, of course, Descartes had already argued. Leibniz could therefore say that he has shown that there exists something other than God—namely, himself as a perceiving, or more generally as a thinking, being.

The question now arises, whether we know of the existence and nature of material things. In the second sentence of the paragraph under discussion, Leibniz says that from my perception of appearances it follows, not only that I exist, but that "there is a cause of the various appearances, i.e., of the variety of perceptions, which is different from that whose form I perceive when I perceive thought." The words "various" and "variety" are a glancing reference to what Leibniz regards elsewhere as a primary truth in its own right, alongside the proposition that we think: namely, that there is a great variety in our thoughts. It was mentioned briefly at the beginning of Section 2 (p. xiv) that Leibniz stated this thesis in a letter to Foucher of 1675 (A II.1, 246; GP I, 370) and that it continued to be his view. What concerns us now is the use that he makes of this primary truth in his paper of 15 April 1676.

Leibniz has said (making a tacit use of the principle of sufficient reason) that there must be a cause of the various perceptions that I have. He has also said that this cause "is different from that whose form I perceive when I perceive thought." The reason for this assertion is to be found in the letter to Foucher of 1675 (A II.1, 248; GP I, 372). The variety that thoughts have, Leibniz says there, cannot come from that which thinks, since one and the same thing cannot be the cause of the changes that occur in it, for "Everything remains in the state in which it is, if there is nothing that changes it." (This resembles Descartes' statement of the principle of inertia, in *Principia Philosophiae,* II, 37. But whereas Descartes argues for this on the basis of God's immutability, it is likely that Leibniz is making another use of the principle of sufficient reason: unless a thing is affected by something other than itself, there is no reason for it to change.) The question now is: what is the cause of the variety in our thought? Leibniz discusses this in a later paragraph of his paper of 15 April 1676, beginning in A 511. One answer which might seem open to him is that there are many such causal agents. These agents are material objects, substances which are not minds, and they cause the percipient to have sensations by acting on other material objects—namely, the percipient's sense-organs and brain. In his early writings, Leibniz had put forward a version of this theory, according to which the material objects in question are atoms.[78] At present, however, the very existence of material objects is

in question, and the answer that Leibniz gives to the question, "What is the cause of the variety in our sensations?" is very different.

He begins by saying that we are certain only that we sense, that we do so in a consistent way, and that we observe some rule in our sensing. Since Leibniz has just said (A 510–11) that the ontological argument for the existence of God is basically sound, he can hardly mean that this is absolutely all of which we are certain; he must mean that this is all of which we are certain, as long as we restrict ourselves to the evidence of our senses. It may also be for this reason that Leibniz, in listing that of which we are certain, does not mention a point made earlier in the paper—namely, that our various sensations have a cause. For our knowledge that there is such a cause cannot be sense-given. There is a further point to be made, which concerns sensing "in a consistent way." When Leibniz says (A 511) that we observe some rule in our sensing, he may be thought to be repeating what he has just said—namely, that we sense consistently. It appears from another paper (A 483: early 1676?), however, that in his usage, a rule is something that we use consciously, such as "Follow this thread in order to get out of the maze." In the present case, the rules that we observe seem to be those that we employ when we predict certain sensations on the basis of others.[79] Leibniz now makes the important point (A 511) that all this is just what existence (or perhaps better, the existence of material things) really is. So he can say later, in the same paragraph, that it is not necessary that a dream should differ from waking experience by some intrinsic reality; a dream need differ only in the order of the sensations involved. "Therefore there is no reason why we should ask whether there exist certain bodies outside us . . . , for we do not explain adequately the terms that are used here. Unless, that is, we say that we call a 'body' whatever is perceived in a consistent way."

Leibniz is putting forward a version of the theory of perception which is commonly known as "phenomenalism"; according to this version of the theory, to talk about bodies is to talk about a set of perceptions that are had by beings such as ourselves. Two special features of Leibniz's version of the theory require notice. First, Leibniz emphasises that the coherence among perceptions of which he speaks holds between the perceptions of several people; existence, he says, consists in the fact that "several people sense the same" (A 511). How we know that there are sentient beings besides ourselves is something that he does not consider here. Second, Leibniz does not lay exclusive stress on the coherence of perceptions; as we have seen, he emphasises the fact that the coherent perceptions have a *cause*.[80] The question now arises, what is this cause? In his letter to Foucher of 1675 (A II.1, 248; GP I, 373) Leibniz suggests (hinting at

Descartes' arguments in *Meditation* I) that there could be some invisible power that produces these consistent perceptions in us, without there being anything that corresponds to them in reality. Such an invisible power, he implies, need not be God; it could be a subordinate power, a spirit (*génie*) of some kind. What Leibniz is considering as a hypothesis, then, is a kind of Berkeleian phenomenalism—but one in which the order displayed by our perceptions is produced, not by God (as in Berkeley), but by a subordinate spirit of the kind just described. Leibniz concedes to the critic of phenomenalism that, the more connection we see in what happens to us, the more we are confirmed in "the opinion that we have of the reality of our appearances." But, he says (borrowing a term from Descartes), this certainly is only "moral," that is, sufficient for practical purposes.[81] Our certainty, he continues, will only be moral until "someone discovers *a priori* the origin of the world that we see, and draws from the very foundation of essence an answer to the question why things are as they appear" (A II.1, 249; GP I, 373). But, he says, we can hardly hope for such knowledge in this life.

Such a view of the causation of our perceptions would be consistent with the paper of 15 April 1676. Indeed, in that paper Leibniz goes further than he did in his letter to Foucher. In the letter, the truth of phenomenalism remains an open question; Leibniz implies that someone might produce a valid argument for the existence of material things. But in his paper from the *De Summa Rerum,* Leibniz has no reservations in arguing for phenomenalism. He says (A 511) that material things do not differ in themselves from dreams; they differ "in beauty" (perhaps this means, in respect of their coherence). Material things and dreams, he is in effect saying, consist of the same stuff; the only difference between them is that in the case of material things, the stuff is better ordered.

One now has to see how this defence of phenomenalism fits into the history of Leibniz's thought. It seems that phenomenalism makes its first appearance in Leibniz's philosophy during his stay in Paris. If one seeks an external stimulus, one need look no further than the philosophy of Descartes; Leibniz may also have been influenced by conversations with one of his Parisian acquaintances, the philosophical sceptic Foucher. At first, in his letter to Foucher of 1675, Leibniz adopts a stance which might be called that of a reluctant phenomenalist. Leibniz admits the power of phenomenalist arguments, and takes the view that although these arguments may be wrong, a refutation of them would be metaphysical in character, and is probably beyond human powers. In a paper from the *De Summa Rerum* written in December 1675 Leibniz is more critical of phenomenalism. Such a theory, he says, cannot account for the existence of unsensed material things; sensation (A 464) "is not the existence of

things, because we declare that there exist things which are not sensed." It is true that in the same paragraph Leibniz says that "The distinction between true and false sensations is simply that true sensations are consistent." But Leibniz need only be describing the way in which we distinguish true from false sensations, and this is by no means the same as saying that to speak of a material object is to speak of a set of coherent sensations.

As we have seen, this critical attitude towards phenomenalism is replaced in mid-April 1676 by whole-hearted acceptance. Phenomenalism is defended again (though not at such length) in a paper written probably in December 1676. In this paper, Leibniz says (A 588) that "we have no idea of existence" (he means, as the context shows, the existence of contingent things, that is, things other than God) "other than that we understand things to be sensed," and later in the paper he says that "without sentient things, nothing would exist." By the time that he came to write the *Discours de Métaphysique* early in 1686, however, his attitude to phenomenalism was again a cautious one, though it did not amount to outright rejection. In passages which he later deleted from the fair copy of the manuscript, he said that the question whether bodies are genuine substances, and hence whether there are substances which are not intelligent, was one which he could not settle at the time of writing.[82] Soon after he wrote the *Système Nouveau,* however, he declared that there are substances which, although immaterial, are not thinking substances such as ourselves. (*Eclaircissement du nouveau système,* April 1686 [GP IV, 495]). His argument for this was based on the principle of the best. Replying to a criticism contained in the *Journal des Savants* of 12 September 1695, he says: "I am asked why God does not content himself with producing all the thoughts and 'modifications' of the soul, without those 'useless' bodies which the soul, it is said, can neither 'move' nor 'know.'" In short, Leibniz is asked why he does not take up a phenomenalist position. He continues, "The answer is easy. It is that God willed that there should be more rather than fewer substances [sc. that besides intelligent substances, there should also be substances that are not intelligent] and that he found it good that these 'modifications' should correspond to something external." To put this in another way: the metaphysical disproof of phenomenalism which Leibniz was seeking when he wrote to Foucher in 1675 is provided by the principle of the best.

6. Minds and Material Things

One of the most distinctive features of the philosophy of the mature Leibniz is the view that a substance either is, or involves, a "substantial form."[83] The concept of a substantial form, which Leibniz took from the

Scholastics (for example, *Discours de Métaphysique,* 1686, secs. 10–11) has two related aspects. On the one hand, there is the teleological aspect: a substantial form is the goal of a thing's endeavour and explains all changes in a thing, whether they are to come or have already occurred.[84] Besides this, a substantial form has what may be called a "unifying" function. A thing is one thing (and really one thing, as opposed to a mere collection) by virtue of its being, or involving, a substantial form.[85] The relation between the two aspects of a substantial form is that what makes a thing *one* thing is to say that it has one basic goal or end. Such, then, is a "substantial form," as Leibniz understood the term. Leibniz says further (and the assertion is an important one) that for "substantial form" one may also say "soul."[86]

Leibniz does not use the term "substantial form" in the *De Summa Rerum;* but there is reason to think that the concept of a substantial form is present in the work, at any rate in an embryonic form. The evidence is provided by the thesis, defended in the *De Summa Rerum,* that for every material thing there must be a mind. Leibniz offers more than one argument for this thesis. One of them is contained in *A Meditation on the Principle of the Individual* (A 490–91), written on 1 April 1676, that is, a fortnight before the phenomenalist paper of 15 April. Leibniz starts from the premise that the effect must involve the cause; for, he says, there must be some connection between the two. He next considers a case which may seem to refute this. Suppose that one square is formed out of two parallelograms, and another exactly similar square is formed out of two triangles. Now, simply from a knowledge of the present state of either square, one cannot tell in which of the two ways it was formed. However, Leibniz refuses to give up the principle that the effect involves its cause, and says that the method of production of each square must be discernible in it. That being so, it is impossible that the two squares should be perfectly similar. But, viewed as material, they are perfectly similar; so what individuates each square must be something immaterial. This something is a mind, which retains the effect of (Leibniz presumably means: which remembers) its former state.

Leibniz's assertion (A 491) that "two things are always different" is an early form of the thesis commonly known as "the identity of indiscernibles" (to Clarke, Paper 4, sec. 5, June 1716; GP VII, 372), which Leibniz expresses by saying that "It is not true that two substances resemble each other entirely and are different in number alone" (*Discours de Métaphysique,* 1686, sec. 9). The arguments offered for this thesis in the *De Summa Rerum* and in the *Discours* are very different from each other. In the *De Summa Rerum,* Leibniz argues from the principle that the effect must

involve its cause, a principle which he justifies by the vague assertion that "there must be some connection" between the effect and the cause. But in the *Discours de Métaphysique* and related works the argument is based on the thesis that each substance has a complete concept which is sufficient to individuate it.[87] What is at issue here is not so much the identity of indiscernibles, as whether one can say that Leibniz's view that each body must be accompanied by a mind is an early version of his mature view that each substance is, or involves, a substantial form. There is a case for saying that it is. In his later philosophy, Leibniz argues for the view that substances are or involve substantial forms on the grounds that a substance must express both its past and its future states; in the famous phrase from the Preface to the *Nouveaux Essais* (A VI.6, 55) a substance's present is "big with the future and laden with the past." In the *De Summa Rerum* Leibniz is saying that a body must be accompanied by a mind if its present state is to involve its past states. He is not arguing from the fact that a substance is "big with the future," but he can be said to be arguing from the fact that it is "laden with the past."

The *De Summa Rerum* contains other arguments for the thesis that thought, as Leibniz puts it, "enters into the formation of matter" (Note of 18 March 1676; A 393). What is distinctive about these arguments is that they involve the nature of material atoms. In the passage just cited, Leibniz appears to argue that there is nothing material by which an atom can hold itself together, and that this task must therefore be performed by some mind. In another paper (*On the Origin of Things from Forms,* April ? 1676, A 521) the argument is that every body which is an aggregate can be destroyed, but that the elements of these aggregates are indestructible bodies. (These elements are not called "atoms," but this is what they seem to be). Such elements exist, Leibniz suggests, "because there is a mind in them." The argument here seems to be that only that which is genuinely one is indestructible, and only a mind is genuinely one. In this connection, we may note that in his phenomenalist paper of 15 April 1676, Leibniz says (A 510) that only "true entities or minds" (*vera Entia seu Mentes*) are one. It was mentioned at the beginning of this section that the mature Leibniz argued that substances must be or involve substantial forms if they are to be genuinely one, and it does not seem far-fetched to suggest that the arguments just discussed from the *De Summa Rerum* are distant forerunners of this argument.[88]

It remains to compare the views that have been discussed in this section with the phenomenalist theory expounded at length in the paper of 15 April 1676. That paper is later than two of the papers in which Leibniz argues that every body must be accompanied by a mind,[89] but there is no

suggestion that Leibniz meant it to be a criticism of them. The question is, however, whether the theories are in fact consistent, and in order to answer this one must first consider exactly what the earlier theory implies. Leibniz has not made clear just what sort of mind accompanies a body. Some years previously, he had implied that there are minds of a low grade when he spoke, in the *Theoria Motus Abstracti* of 1671, of the body as "a momentary mind, i.e., one which lacks memory" (A VI.2, 266).[90] The minds which, according to the *De Summa Rerum,* accompany bodies do have a memory, but it seems unnecessary, and unlikely, that they should be thought of a *rational* minds, or even as souls on the same level as those of the animals. These too, then, may be regarded as minds of a low grade. There is no hint of such minds in Leibniz's phenomenalist theory; further, even if they are allowed in it, they cannot have the function that they have in the earlier theory. There they are assumed to be necessary for the unity of bodies; and this idea is foreign to Leibniz's phenomenalist theory, where a supernatural *génie* is thought to be a sufficient reason for the coherence of our perceptions. It is difficult to avoid the conclusion that Leibniz has not, at this stage, thought his different theories through to the end.

7. Space and Time

We come now to what Leibniz has to say in the *De Summa Rerum* about space and time. In his paper of 15 April 1676 Leibniz offers a phenomenalist theory, not only of material things, but of space as well. He says that just as there is no reason for asking whether there exist certain bodies outside us, so there is no reason for asking whether space exists—unless (A 511) "We say . . . that 'space' is that which brings it about that several perceptions cohere with each other at the same time." One may ask how, in that case, one could differentiate space from that which—be it God or a demon—makes our perceptions cohere in such a way that we say, "This is a material thing." From the explanation which follows, it appears that one should emphasise the phrase "at the same time." Leibniz seems to be drawing attention to the fact that although (say) I may arrive successively at places A, B, and C, I regard these places as co-existing simultaneously in the same space. My reason for saying that they do so is just the fact that from information about the time taken to reach certain members of this set of places (that is, to have certain sorts of experiences) I can infer how long it will take me to reach other members of the same set (that is, to have certain other experiences).

The simultaneity of the parts of space had been asserted by Leibniz previously, in a draft of a paper *On the Reasons of Motion,* summer 1669–

early 1670 (A VI.2, 167). The notion of simultaneity also plays an important part in his later view that space is an order of co-existence (see, for example, to Clarke, Paper 3, February 1716, sec. 4; Paper 5, August 1716, secs. 29, 47, 104). What is distinctive about the view stated in the paper of 15 April 1676 lies in Leibniz's account of the basis of the assertion that the parts of space are simultaneous—namely, people's ability to make inferences of a certain kind from sensations to other sensations.

In this paper Leibniz also says—anticipating a twentieth-century discussion of space and time[91]—that "infinitely many other spaces and other worlds can exist, in such a way that between these and ours there will be no distance." For to say this is simply to say that there could exist "certain minds to which other things appear which are in no way consistent with ours" (A 511). Leibniz uses the idea of other possible spaces to prove that space differs from God, saying that although there could be several spaces, there is (perhaps he should have said, there can be) only one God (A 512). But although God is not a space or spaces, Leibniz holds (ibid.) that God is equally present to all spaces and to all worlds. This is by virtue of that perfection of God which Leibniz calls "immensitas," which will be rendered here as "immeasurability."[92] In calling God "immeasurable" Leibniz means that he is ubiquitous, and has "a perfection which is found in things when there is ascribed to them being somewhere, or being present."[93] Leibniz does not explain what it means to say that God is "present to" a world which is (by his own arguments) a mere phenomenon. But perhaps he would say that to talk of God's immeasurability is to talk of a certain power of God—that power which creates and conserves minds which have perceptions which cohere in a certain way.

Elsewhere in the *De Summa Rerum,* Leibniz has more to say about the way in which space is related to the immeasurability of God. In a paper *On the Origin of Things from Forms* (April ? 1676), which was quoted in the last section, he takes as primary what he calls "absolute extension" (A 519), by which he means extension which is not qualified in any way. He seems to regard absolute extension as the same as immeasurability, and hence as one of the perfections of God.[94] Absolute extension, he says, is the basis of space; it differs from space in that space is divided into parts and is changeable, whereas absolute space is indivisible and is not changed, in that it is that which remains throughout changes (ibid.).[95] Leibniz now has to explain how absolute extension, or immeasurability, is the basis of space, and here it emerges that there is a complexity in his concept of space. Leibniz's view is that although the immeasurable is not changed, it can be modified by means of the addition of bulk or mass (*moles sive massa*), which gives rise to spaces, places,[96] and intervals.

The aggregates of all these give what Leibniz calls "universal space," which he declares to be an "entity by aggregation," that is, as something which has no existence outside that of its components. Universal space is continually changed as the spaces which compose it change.[97]

The idea that space is in constant change is somewhat paradoxical; one would expect Leibniz to say, not that space changes, but that things change their position within one changeless space. This is indeed a view that Leibniz put forward in a paper *On the Nature of Corporeal Things*, written before he came to Paris (A VI.2, 305; second half of 1671?). But despite the paradox, this passage from the *De Summa Rerum* is of great interest, in that one can see it as containing the seeds of the famous account of the nature of space given in sec. 47 of the fifth paper to Clarke (GP VII, 400–02). In explaining the concept of space in that paper, Leibniz begins by explaining the concept of place, and then declares space to be "that which results from places taken together." In much the same way, Leibniz in his earlier paper begins with particular spaces, places, and intervals, and derives from these the concept of a universal space.

What has just been discussed could be called, in traditional language, an account of the essence of space. Leibniz has also things to say in the *De Summa Rerum* about some of the properties of space, namely its infinity and its continuity. In a paper written towards the end of the period (A 585; 12 December 1676) Leibniz offers an argument for the infinity of space. The argument involves the principle of sufficient reason and asserts that, whatever size we assume space to be, there is no reason why it should not be made larger.[98] In the previous paragraph of this paper Leibniz has referred to the creativity of God, and it is most natural to suppose that in the present context he means that there is no reason why God should restrict his creativity by producing a space that is only finite. He was to argue along similar lines towards the end of his life, saying, not that space, but matter must be infinite, because there is no reason that can limit its quantity. (To Clarke, Paper 4, June 1716, sec. 21; cf. Paper 5, August 1716, secs. 30, 73).

The other property of space mentioned above was its continuity. In the course of his life, Leibniz often discussed a problem that he called (after the title of a book published in 1631 by Liber Froimont, or "Fromondus") "the labyrinth of the continuum." The problem, as Leibniz stated it in the Preface to the *Théodicée*, consisted in "the discussion of continuity, and the indivisibles which appear to be its elements," and it was one into which "a consideration of the infinite must enter" (GP VI, 29). In the *De Summa Rerum*, Leibniz mentions the problem as one which needs precise investigation (A 475, 11 February 1676), but he does not offer a solution in

the papers that constitute the work; he merely states a few preliminaries. Discussing the nature of matter in the paper just mentioned, he asserts that space is a continuum. Matter alone, he says (A 473), can be explained by multitude without continuity, and this shows the difference that there is between matter and space.[99] Earlier, in December 1675, Leibniz had offered an argument for the thesis that space does not consist of discrete parts. The argument is based on the principle of contradiction. If there were least parts in space, Leibniz says (A 469), then there would be as many minimal parts in the diagonal as in the side, which is absurd. Space, then, is continuous; but Leibniz does not ask in the *De Summa Rerum* how continuity can, in the language of the *Théodicée*, be related to "the indivisibles which appear to be its elements."[100]

We come now to what Leibniz has to say about time in the *De Summa Rerum*. The chief interest of this lies in his account of the relations between time, duration, and eternity. Just as Leibniz relates space to God's immeasurability, so he relates time to another of God's perfections, namely eternity. In some notes of 18 March 1676 he says (A 392) that "that which is divine and eternal in space is the same as God's immeasurability, and . . . that which is divine in time is the same as eternity." A little later (A 520; April ? 1676) he says that God is "absolutely enduring, i.e., eternal." It will be noticed that in these passages, eternity is related both to time and to duration. The difference between time and duration is explained in a paper on magnitude (A 484, early ? 1676), in which Leibniz says that "time is something continuous, according to which something is said to endure." So, for example, a day is not a duration; for we say that the ephemerids[101] endure *for a day*. Much the same distinction is to be found in later works: for example, in the *Entretien de Philarète et d'Ariste* (1712–15)[102] Leibniz says (GP VI, 584) that "duration and extension are attributes of things, but time and space are taken as being outside things, and serve to measure them."[103]

What Leibniz has to say about the relation between time or duration on the one hand, and eternity on the other, is complicated by the fact that there is an ambiguity in the term "eternity"—an ambiguity of which he was well aware.[104] In the paper on magnitude quoted in the last paragraph (A 484, early ? 1676) Leibniz says that if we conceive eternity as something which is homogeneous with time, it will be unlimited time, and that if we conceive it as the attribute of something eternal, it will be duration through infinite time. But, Leibniz continues, there is a better way of conceiving eternity, which gives its "true origin and inmost nature." In the passage from A 392 quoted earlier (notes of 18 March 1676) Leibniz makes it clear that when he says that "that which is divine in time is the

same as eternity," he means by eternity "the necessity of existing."[105] But he does not seem to be always consistent in this usage; for example, his remark in A 520, that God is "absolutely enduring, i.e., eternal," suggests a concept of the eternal as that which lasts for ever.

What is certain is that Leibniz thinks it proper to speak of time as infinite, whether or not an infinity of time is properly called "eternity." This is clear from a paper of 12 December, in which Leibniz says that (A 584) the infinity of time, like that of space, needs a perfect demonstration. It cannot be said that the paper provides such a proof, or indeed that it was intended to provide it. What Leibniz does say is that it makes no sense to assert that there was a time in which there were no things, since there is no way in which the quantity of that time could be determined. This is an interesting anticipation of Leibniz's mature view that there is no absolute time. (To Clarke, Paper 3, February 1716, sec. 6; Paper 4, June 1716, sec. 15).

Leibniz argues that, just as there are no minimal parts of space, so there are no minimal parts of time, his reason being that to suppose such parts would involve a contradiction (A 469, December 1675). He seems to imply, however, that there is no contradiction in the notion of a moment,[106] just as there is none in the notion of time (ibid.). Leibniz does not explain fully in the *De Summa Rerum* what a moment is, but says only that between any one moment and its immediate successor or predecessor[107] there is no interval, and that in this respect a time differs from a line (A 584, 12 December 1676). But it must be said that his thought on this topic in the *De Summa Rerum* is far from coherent. Towards the end of the paper of December 1675, in which he seems to suggest that the idea of a moment is not self-contradictory, he says (A 470) that to be in a place is to pass through a place, "since there is no moment." This suggests that a moment would be a minimal part of time.

8. Atoms and the Actual Infinite

The problem of the labyrinth of the continuum concerned, in the words of the *Théodicée,* continuity and "the indivisibles which appear to be its elements" (GP VI, 29; quoted in Section 7, p. xxxvii). Leibniz was faced with the problem, not only whether there are indivisible spaces and times, but also whether there are any indivisible units of matter—in other words, whether there are any material atoms. The mature Leibniz believed firmly in the "actual infinite"; that is (as he put it in a letter to Foucher, 1693; GP I, 416), that "There is no part of matter which is not, I do not say divisible, but actually divided, and that consequently the smallest particle must be regarded as a world full of an infinity of different creatures." From this

point of view there can be no atom, no tiny portion of matter at which the process of subdivision stops. Leibniz had not always taken up this position. In a well-known passage from the *Système Nouveau* (1695), in which he spoke about his earlier philosophy, he said that "At first, when I had freed myself from the yoke of Aristotle, I believed in the void and in atoms, for this is what best satisfies the imagination. But abandoning this after much meditation, I perceived that it is impossible to find *the principles of a true unity* in matter alone" (GP IV, 478). The question now is, what were his views on these topics during the period covered by the *De Summa Rerum*.[108]

The answer is that they seem to have been in a state of confusion. It was noted in Section 6 (p. xxxiii) that in March and April 1676 Leibniz was arguing for the presence of minds in corporeal things from a standpoint that assumed the existence of atoms (A 393, 521). Leibniz was also arguing for the existence of atoms in another paper written early in 1676 (A 524–25), and as late as 12 December 1676 he was still saying (A 585) that the existence of atoms can be demonstrated. Yet even before his stay in Paris he had stated in a paper entitled *De Materia Prima* (1670–71?) that there is an actual infinite, and that there are no atoms (A VI.2, 280). The same view is taken in works written towards the end of the period of the *De Summa Rerum*. So, in *Pacidius Philalethi* (29 October–10 November 1676) Leibniz says (A 565–66) that bodies are really subdivided to infinity, and that therefore there are no atoms. The actual infinite is also asserted in the *De Summa Rerum* itself, in notes of December 1676 (A 400).

There is a further complication. In the account of his early views given in the *Système Nouveau,* Leibniz said that he "believed in the void and in atoms," and indeed belief in a vacuum was usually part of an atomic theory. Leibniz argued for the existence of a vacuum early in the *De Summa Rerum,* saying (A 466, December 1675) that there is no perfect fluid filling all space, and that space is therefore a vacuum. Later in the *De Summa Rerum,* however, he argued that there exist both atoms and a plenum—indeed, he argued from the existence of a plenum to the existence of atoms (A 524–25, early ? 1676; A 585, 12 December 1676).[109]

In the face of all this confusion, it seems best to select from the *De Summa Rerum* the arguments that support the views which the mature Leibniz held: that is, the arguments for the thesis that there is an actual infinite (and therefore no atoms) and that there is no vacuum, but that on the contrary all things constitute a plenum. In arguing for these conclusions in the *De Summa Rerum,* Leibniz uses both the principle of harmony and the principle of sufficient reason. He uses the former to establish the

existence of the actual infinite, stated by him as "Any part of matter, however small, contains an infinity of creatures" (A 474, 11 February 1676). Such a state of affairs, Leibniz says (ibid.) "increases the multitude of existents and the harmony of things."[110] He also uses the principle of harmony to establish the thesis that the universe is a plenum, both in the paper just quoted (A 473) and earlier, in a paper of December 1675 (A 467). Leibniz has another argument for the plenitude of the universe, which is based on the principle of sufficient reason. This argument is contained in a paper of 12 December 1676, and is similar to an argument from the same paper for the infinity of space (cf. Section 7, p. xxxvi). There is no vacuum, Leibniz says, because there is no reason why all things should not be filled.[111]

In his later works, Leibniz argued for these theses in the same way. In the postscript to his fourth paper to Clarke (June 1716; GP VII, 377–78) he says that the actual infinite is derived from the perfection of God. In effect, his argument is based on the principle of harmony; Leibniz reasons that any perfection that God could put in things, without derogating from other perfections in them, has been put there; therefore there is no corpuscle which is not subdivided.[112] The same argument is used against the existence of a vacuum, Leibniz saying (*Specimen Inventorum,* 1686–95, GP VII, 315) that a vacuum is inconsistent with the perfection of things.[113] Leibniz also uses the principle of sufficient reason as an argument against the existence of a vacuum (to Clarke, Paper 4, postscript, GP VII, 378), as he had done in the *De Summa Rerum;* in the later paper, however, his argument is more sophisticated, in that he says that there can be no principle determining the ratio of matter to the void. Leibniz's later papers contain some further arguments for the actual infinite and for the plenum;[114] yet the main lines of his reasoning are those laid down in the *De Summa Rerum.*

9. Laws of Nature

One of Leibniz's constant aims was to discover, and give a priori proofs of, universal laws about the nature of created things. The *De Summa Rerum* shows many signs of this concern; further, the laws and the arguments for them anticipate much of Leibniz's later philosophy. As may be expected, the principles of sufficient reason and of harmony play a part in these arguments; but they are by no means the only principles that are used.

(a) The first of the laws to be considered here is that there is "no vacuum among forms" (A 473, 11 February 1676). In his later works, Leibniz said that this had been a topic of discussion among previous philosophers,[115]

and it is doubtless for this reason that he does not explain the term in the *De Summa Rerum*. It is clear from later works (for example, *Nouveaux Essais*, 3.6.12), however, that what is meant is that (subject to a certain qualification) there are no possible species that do not exist. The relation between this and the denial of a vacuum in space is that in each case Leibniz denies the existence of gaps. But in the present case, the gaps that are denied are not holes in the physical world; rather, Leibniz is saying that nothing is lacking that can contribute to the variety of the world. In the *De Summa Rerum*, Leibniz says that this follows from the principle of harmony; similarly, in the *Nouveaux Essais* (ibid.) Leibniz declares that "All the things that the perfect harmony of the universe can admit, are in it." The qualification mentioned above is that (A 581, 12 December 1676; see also *Nouveaux Essais*, 3.6.12, and Section 4 above, p. xxvi) Leibniz does not accept the view that absolutely all possibles exist; one must therefore suppose him to mean that in the best possible world, there exist all the species that are "compossible." In his later writings, Leibniz often appeals to the non-existence of a vacuum of forms to support his view (contrary to what he took to be the view of Descartes) that the lower animals have perceptions and feelings.[116] But there is no hint of this line of argument in the *De Summa Rerum*.

(b) The second of the laws with which we are concerned is contained in a paper on simple forms, written in April 1676; Leibniz states it there as (A 523) "All things are in a sense contained in all things." He argues for this on the basis of a thesis that he was later to express by saying that there are no purely extrinsic denominations, which do not have a basis in the thing denominated.[117] In the paper of April 1676, Leibniz begins by giving a particular example. Borrowing from Plato's *Theaetetus*, which he was studying at about this time,[118] he says, "When someone, by growing, becomes bigger than me, then some change occurs in me as well, since a denomination of mine is changed." He then says, "In this way, all things are in a sense contained in all things."

This needs careful consideration. First, it is clear from Leibniz's argument that when he says that all things are "in a sense" contained in all things, he means at least that whenever there is a change in anything whatsoever, there is a corresponding change in me, and whenever there is a change in me, there is a corresponding change in every other thing. The question is, whether this is all that he means here. Later, Leibniz would have argued, not only that (say) Socrates changes when Theaetetus changes, but that all changes in Theaetetus, and indeed in the entire universe, can be inferred from a full knowledge of the nature of Socrates—a form of the thesis that each substance "expresses" the whole

universe. (For example, remarks on a letter of Arnauld, May 1686, GP II, 41.) It is not certain that Leibniz would go as far as this in the paper of April 1676 just quoted. In a paper written at the very end of the period covered by the *De Summa Rerum* (December 1676), however, Leibniz stated what appear to be his later views about the expression of the universe by any one individual. He wrote (A 400) that, "A substance, or, a complete being, is that which by itself involves all things, or, for the perfect understanding of which the understanding of nothing else is required." This is a passage of great importance, which looks ahead to the *Discours de Métaphysique* of 1686 and the works related to it. It should be added that in these works, Leibniz regarded the proposition that there are no purely extrinsic denominations as one that could be *proved,*[119] but there is no hint of this in the *De Summa Rerum.*

(c) Another law stated in the *De Summa Rerum* is the proposition that "the entire effect (*effectus integer*) is equipollent to the full cause (*causa plena*)" (A 584, 12 December 1676). This law, which is often mentioned by Leibniz in his later works,[120] is also stated by him in other papers which belong to the period of the *De Summa Rerum.* For example, in a paper on "Three Primary Axioms," which may belong to the period summer 1674–autumn 1676, Leibniz says (A 427) that "the entire effect is equipollent to its cause." Again, in a scientific paper of summer 1676, *De arcanis motus* (H.-J. Hess, ed., *Studia Leibnitiana Supplementa* 17 [1978], 203), Leibniz states that "In mechanics everything depends on the equation between the full cause and the complete effect," and that "the primary axiom of mechanics is that the power of the full cause and the entire effect is the same."

Leibniz does not make clear in his paper of 12 December 1676 how this proposition is to be justified, saying vaguely that "There must be some equality between cause and effect, passing from one to the other," and that the only measure of this equality is the equipollence of which he has spoken (A 584). However, some light is thrown on what he means by the earlier paper *De arcanis motus,* which was mentioned in the last paragraph. In this paper, Leibniz offers a proof of the proposition; or rather, he offers a partial proof, since he says that a full proof would involve metaphysics. He begins by saying that from a given full cause there necessarily follows an entire effect; therefore a full cause is the state (*status*) of everything that is relevant—that is, whose action contributes to the effect—taken at the same time. Similarly, an entire effect is the state of everything which is relevant at some later time, which state has followed logically (*est consecutus*)[121] from the previous state. Now, cause and effect are necessarily connected, and this connection can be demonstrated;

for every necessary proposition is demonstrable. But since demonstration is performed by analysis into identical propositions,[122] it follows that cause and effect, when perfectly analysed, must eventually end in the same. Now, since it is necessary that one effect follows from another, that identity must always be preserved. Further, that identity can consist only in the respect in which there is agreement; but the agreement consists in the fact that both cause and effect have a certain power, that is, a capacity for producing another effect. The difference between them lies only in a difference of application and situation, "just as one and the same line, however it is bent, retains the same length." One is left wondering what are the metaphysical considerations which, according to Leibniz, are necessary to complete the proof. Leibniz gives no hint of an answer; but it is noticeable that no proof is offered of the proposition on which the whole proof depends—namely, that from a given full cause there necessarily follows an entire effect.

(d) The proposition that the full cause is equipollent to the entire effect is clearly a conservation law, and indeed in the *Théodicée* (sec. 346, GP VI, 319) Leibniz speaks of "assuming that the effect is always equal in force to its cause, or, what is the same things, that the same force is always conserved." In the *De Summa Rerum,* Leibniz states a conservation law which is derived from a principle different from that of the equipollence of cause and effect. In a paper of December 1675 (A 467–68) Leibniz argues that the quantity of motion is conserved, and that this can be shown from the plenitude of things. He regards plenitude as following from, or at least as consistent with, the harmony of things, and so he can say (A 468) that to suppose a loss of motion is to suppose the entire harmony of things to be disturbed.[123]

In his later works, Leibniz repeatedly criticised Descartes for saying (*Principia Philosophiae,* II, 36) that the same quantity of motion is conserved. What is conserved, Leibniz argued, is not the quantity of motion—the product of mass and velocity—but the quantity of force, the product of mass and the square of the velocity. The question arises, whether this concept of force is to be found in the *De Summa Rerum.* Leibniz's first published statement of his law of the conservation of force was made in March 1686, in his *Brevis Demonstratio erroris memorabilis Cartesii et aliorum circa legem naturae* (GM VI, 117–19), but the law is also stated in many unpublished papers written before that date.[124] There is a paper from the *De Summa Rerum* (*On the Origin of things from forms,* April ? 1676, A 522) in which Leibniz says that "forces always remain the same," his argument for this being that an increase would be without reason. However, scholars have established that Leibniz's first use of his

new concept of force was in a paper entitled *De corporum concursu*, written in January and February 1678.[125] What Leibniz says in the *De Summa Rerum* about the conservation of forces must therefore be taken in some other way. It may simply be a restatement of the view that the full cause is equipollent to the entire effect, or it may be another way of stating what is said in A 467–68—namely, that the quantity of motion is conserved.

10. The Human Mind and its Relation to God

One of the primary truths stated in the *De Summa Rerum* is that "I have such and such appearances" (A 508; cf. Section 2, p. xiv). Leibniz declares that it follows immediately from this that I exist. He does not say expressly that the "I" which is known to exist is a thinking being; however, this is implied by the fact that the passage in question goes on to say that "I think" must occur first in the order of philosophising. But what is a thinking being—a mind—and why should minds exist? This section will be concerned with Leibniz's answers to these questions. Assuming a rough knowledge of what it means to talk about minds, we will consider first Leibniz's answer to the question, why there should be any minds, and will then ask just what this means.

It was seen earlier that Leibniz declares God to be a mind (Section 3, p. xxi), and we have also seen Leibniz's answer to the question, why there is a God. The answer, briefly, is that God is a necessary being, which is to say that the reason for his existence is contained in himself. But why should there be minds other than God? Leibniz answers (A 512) that minds are created by God; more precisely, that they exist "by the will of God, that is, by the understanding of the good." One might perhaps expect Leibniz to say that the mere existence of minds increases the variety of things, but in fact he argues from a certain feature that minds have—namely, that they are a kind of mirror of the world. Minds exist, he says (A 474; 11 February 1676), "simply because the supreme being judges it harmonious that there exists somewhat that which understands, or, is a kind of intellectual mirror or replica of the world." Such a state of affairs is harmonious because (A 523) perception "multiplies to infinity the variety of things."

But what, according to Leibniz, is a mind; more specifically, what is a human mind? We may begin with a negative feature of the mind: namely, that minds are not bodies. A human mind is a thinking being,[126] and there are fundamental differences between thought and matter. In the first place, thought does not have shape and motion, as extended things do (A 464).[127] Second, Leibniz draws attention to what would now be called the "intentional" character of thought. Thought, he says in a paper on forms

(A 513), has both a subject and an object, whereas extension has a subject alone. Leibniz means that whereas we can speak both of that which thinks and of that which is extended (that is, both thought and extension have a subject), only thought has an object, in the sense of being *about* something.

The "intentional" character of thought is taken up in one of the things that Leibniz says about ideas. We have already seen something of Leibniz's use of the term "idea," in the course of a discussion (Section 3, p. xviii) of his insistence that we must prove that we really have an idea of God, that is, that God is something that is possible. In that context, to have an idea of X is to have a concept of X that is self-consistent. But Leibniz also says (A 518, 521) that an idea is a differentia of thoughts in respect of an object. In this case, what is at issue is not the self-consistency of a concept; rather, Leibniz is classifying ideas by saying that they form a species of the genus thought, and that what differentiates them from other thoughts is the fact that an idea is about something. Strictly, then, it is by virtue of being ideas that thoughts have objects.

Minds, then, are not bodies; but what are they? If Leibniz had given a systematic account of the nature of mind in the *De Summa Rerum,* he would probably have begun by saying that the mind is an incorporeal *substance*. Certainly, early in his stay in Paris he worked on a paper entitled *Demonstratio substantiarum incorporearum* (*A Demonstration of incorporeal substances*); autumn ? 1672 (A 73–93). Leibniz does not say expressly in the *De Summa Rerum* that minds are substances, but this is implied by his statement that the only genuine entities are minds (A 510, quoted in Section 6, p. xxxiii). The mind's activities, then, are the activities of a substance. With regard to these activities, we have seen that the mind thinks and that it has ideas; we know also, from Leibniz's phenomenalist analysis of the nature of material things, that the mind perceives (A 508; cf. Section 5, p. xxvii). It is important to note that, when Leibniz speaks of perception, he does not always mean the mind's perception of material things; he also says that the mind perceives itself (A 509, 15 April 1676). In one paper (A 587, December 1676) he goes so far as to say that to think is simply to sense oneself. In the same paper, Leibniz says (ibid.) that to think is to act on oneself. This view was one which he held before his stay in Paris (A VI.2, 283, early 1671–autumn 1671: to think is to change oneself), and its meaning is perhaps best explained by another paper from the *De Summa Rerum,* written probably in February 1676. In this, Leibniz says (A 480) that we do not act like simple machines, but that we act out of reflection—that is, we act on ourselves. In saying that to think is to act on oneself, then, Leibniz is drawing attention to the fact that

to think is to reflect.[128] Throughout his life he insisted on the importance of reflection or attention, and was fond of citing such proverbs as "Dic cur hic" ("Say why you are here"), "Respice finem" ("Look to the end"), and "Vide quod agas" ("Think of what you are doing").[129]

Leibniz says that although our perceptions are the work of our minds, they cannot be explained by a consideration of minds alone. Our mind, he says, is added (*addita est*) to matter, and without matter it would not perceive as it does (A 518). This continued to be his view; for example, in a paper written late in life (*Metaphysical Consequences of the Principle of Reason,* 1712?, C 16) he says that "a soul is always endowed with an organic body, so that it has that through which it may represent other external things in an orderly way."[130] Leibniz is of course faced with the problem of explaining how the body acts on the mind, and conversely; but all that he says about this in the *De Summa Rerum* is that (A 518) "It is wonderful how the nature of matter and of the mind brings it about that certain dispositions [he must mean, certain *material* dispositions] produce in our mind the sensation which is called that of light, or redness, and other sensations."

One of the most striking metaphysical doctrines of Leibniz's maturity is his view that every substance perceives everything that happens in the entire universe.[131] Leibniz does not go as far as this in the *De Summa Rerum,* but he does say that every *mind* "perceives simultaneously whatever happens in the entire world" (early ? 1676, A 524).[132] He argues for this on the basis of his thesis that the universe is a plenum, the argument being (A 524; cf. Hobbes, *De Corpore,* III, 15, 7) that whatever happens in any body whatsoever must be transmitted to the body of the percipient. (It is clearly assumed here that the altered bodily state of the percipient will be accompanied by a perception). A somewhat similar use of the principle of plenitude is to be found in the *Primae Veritates* of about 1689, in which Leibniz argues (C 521) that each created substance acts on, and is acted on by, all others. The argument is that any change in one body is transmitted to all others, much as "In a vessel full of liquid (and the whole universe is such a vessel) a motion set up in the middle is propagated to the edges." He does not, however, go on to argue from this that each substance perceives the entire universe; and indeed in his mature works this proposition is defended in a different manner, namely as a way of stating the thesis that each substance "expresses" the entire universe.[133]

It might be objected to Leibniz that it is plainly false that each mind perceives, at the same time, everything that happens in the entire world. Leibniz would reply (A 524) that the omniscience of a mind is only "confused." He explains what he means by this when, after saying that

each mind perceives simultaneously everything that happens in the world, he continues: "These confused perceptions of infinite simultaneous varieties produce the sensations that we have of colors, tastes, and feels." His argument for this is that each sensation is an infinite aggregate of perceptions. This is especially the case, he says, when the sensation of (say) a color requires a certain length of time; for "Time is infinitely divisible, and it is certain that at any moment the soul perceives various things, but from all these infinitely many perceptions confused into one there arise the perceptions of sensible things." From this it emerges that when Leibniz says that our sensations are confused, he means that we do not notice each separate item out of the infinity of things that we perceive at any one time. These were views that Leibniz continued to hold. The view that the soul is omniscient, but in a confused way, is to be found in the *Principes de la Nature et de la Grâce* (1714), sec. 13, in which Leibniz says that "Each soul knows the infinite, knows everything, but confusedly." The view that sensation is confused perception is expressed clearly in sec. 33 of the *Discours de Métaphysique*, where Leibniz says, "Although our senses are related to everything, it is not possible for our soul to be able to attend to everything in particular. This is why our confused sensations are the result of an absolutely infinite variety of perceptions"—much as the confused murmur of the sea "comes from the accumulation of the repercussions of innumerable waves."[134]

The *De Summa Rerum* also offers arguments for the immortality of the mind. Leibniz had already argued for the conclusion in one of his earliest works, the *Confessio Naturae contra Atheistas* (1669) (A VI.1, 492–93; GP IV, 109–10). The premise of his argument there was the proposition that the mind is not in space. From this, Leibniz inferred that the mind is not movable, for motion is change of space; but whatever is immovable is indissoluble, and therefore incorruptible. The arguments offered in the *De Summa Rerum* are different from this. In a paper of 15 April 1676 Leibniz starts from the premise that every impression which occurs in a body has some effect which proceeds to infinity. He does not say why this should be so, but he could appeal to his thesis that the universe is a plenum, which he uses when arguing that the effects of the action of any body in the universe are transmitted to the body of a percipient. (Cf. A 524, quoted earlier in this section).[135] He then argues that it would be absurd to say that the effects of actions other than perceptions endure for ever, but deny this of the effects of sensations. This is hardly convincing; it might be replied that the effects of (say) my perceptions might be found in the perceptions of other people, so that the effects could continue even if my mind ceased to exist. Perhaps Leibniz became dissatisfied with this argument; certainly, it

does not seem to appear in his later works. Another argument for the immortality of the mind which also seems peculiar to the *De Summa Rerum* is to be found in a paper of 12 December 1676 (A 581). Here, Leibniz in effect appeals to the principle of harmony, taking as a principle the proposition (A 582) that whatever can exist and is compatible with others, does exist. But the immortality of the mind is possible in itself, and is compossible with others; therefore the mind is immortal. In saying that the mind's immortality is "compossible with others," Leibniz seems to mean that it is compossible with the existence and nature of material things; for he goes on to say that minds "have no volume."

It remains to discuss what the *De Summa Rerum* has to say about the mind's relations to God; this will also add to our knowledge of Leibniz's concept of God. In sec. 35 of the *Discours de Métaphysique,* Leibniz puts forward an argument for the immortality of the soul which is based on the nature of God. He says that one must consider God, not simply as the cause of all things, but as "the chief of all persons or intelligent substances, and as the absolute monarch of the most perfect city or commonwealth, such as is that of the universe which is composed of all minds taken together." His argument is that just as one would praise a human monarch who preferred to preserve the life of a man rather than that of the most precious of his animals, so one may not doubt that God—the most enlightened and just of all monarchs—is of the same opinion. Leibniz does not produce such an argument in the *De Summa Rerum,* but he does say in a paper of 11 February 1676 (A 476) that God and other minds form a commonwealth,[136] of which God is king. It follows from this, he says, that there is no necessity in the world for anyone to be unhappy;[137] if we have a good will—and God's grace consists in endowing us with a will[138]—then happiness is in our power. This shows that, in the *De Summa Rerum,* Leibniz is not just concerned to establish truths about the nature of the universe, he is concerned also (as he was throughout his life) with problems of theodicy, problems concerning the justification of God.

Leibniz has more to say about the nature of God in the paper of 11 February 1676 just cited. What he says springs from his discussion of the grace of God, and although it is only a passing remark, it is of great importance. There is, says Leibniz (A 477), no need of miracles to explain the grace of God. Just why miracles should be needed for this purpose is not clear, but perhaps Leibniz has in mind the idea that the miracles performed by (say) a biblical prophet might be a sign of the special favour in which the prophet was held by God. What is important, however, is Leibniz's reason for rejecting the view that miracles are required. God, he says, "arranged all things from the beginning" to occur in the way in

which they do occur. Why this should be said of God is not explained, but doubtless Leibniz means that a God who had to make changes in his initial plan would not be a perfect being. This was to become an important theme of Leibniz's later philosophy. It was a major topic of the controversy with Clarke of 1715–16; God, says Leibniz, did not create a world-machine so imperfect that it has to be cleaned and repaired from time to time.[139] It was also one of Leibniz's reasons for rejecting occasionalism, and for putting forward his own theory of a pre-established harmony between created substances.[140]

11. Conclusion

At the beginning of this introduction (Section 1, p. xii) it was said that the writings that constitute the *De Summa Rerum* provide a sketch of a metaphysical system, which contains much of Leibniz's mature philosophy. That claim has been defended in the course of this introduction, but it will be useful at this stage to make a survey of the ground that has been covered. Let us begin by looking again at the principles that Leibniz uses to establish his conclusions. In his mature works, he said (cf. Section 4, p. xxii) that human beings use two great principles in their reasoning—those of contradiction and of sufficient reason. It emerges that by the latter term he means two principles: a general one, which states that everything can in principle be explained, or that every truth can in principle be proved, and a more restricted principle which refers to the reason that God had for creating one kind of universe rather than another. In its restricted form, the principle is less ambiguously called the principle of the best. All three principles are used in the *De Summa Rerum.* As in Leibniz's later works, the principle of contradiction is used in the ontological argument for the existence of God, whether this takes the form of saying that it is self-contradictory to suppose that a most perfect being does not exist, or to suppose that a necessary being does not exist (Section 3). One also finds in the *De Summa Rerum,* as in Leibniz's later works, an argument for the existence of God based on the principle of sufficient reason (Section 4). Leibniz also uses the principle of sufficient reason, in the *De Summa Rerum* and in his later works, to establish propositions about the nature of the universe: that space is infinite (Section 7), that the universe is a plenum (Section 8) and that the same quantity of force always remains (Section 9)—though it must be noted that the *De Summa Rerum*'s concept of force is not that of Leibniz's maturity. Leibniz also uses the principle of sufficient reason in his theory of the nature of material things. He regards the proposition "I have such and such appearances" as a primary truth (Section 2), and argues that these appearances or perceptions must have a cause

(Section 5). In the *De Summa Rerum,* he explores the possibility that the cause in question might be a supernatural spiritual being, but he later abandoned the idea.

Leibniz's concept of God in the *De Summa Rerum* is the same as that of his maturity. He asserts that not all possibles are compossible (Section 4) and that God chooses between possibles in creating the universe. God, therefore, has intellect and will, and the reason why God wills as he does is provided by what Leibniz was later to call the principle of the best, though in the *De Summa Rerum* he prefers to speak of "harmony" rather than of the "best." To create what is harmonious is to produce the greatest result with the least expenditure of effort and, as in his later works, Leibniz uses this principle in the *De Summa Rerum* to provide proofs of what the world must be. He uses it to prove that the universe is a plenum (Section 8) and, through this, that the same quantity of motion is always conserved (Section 9). He also uses it to prove that there is no "vacuum of forms" (Section 9) and that there is an "actual infinite," that is, that each part of matter is actually subdivided to infinity (Section 8). Besides this, Leibniz uses the principle of the best, or of harmony, to show why it is that individual minds exist (Section 10). The proposition that the universe is a plenum (argued for both on the basis of the principle of sufficient reason and of the principle of harmony) provides the basis of the assertion that each mind perceives everything that happens in the entire universe (Section 10). Since it is evident that a finite mind does not notice everything, Leibniz is led to introduce the concept of confused perception, and a theory of the confused nature of sense-perceptions (Section 10).

These three principles are not the only ones used in the *De Summa Rerum.* Leibniz also asserts that the effect must involve its cause, and on the basis of this he argues that no two things can be perfectly alike, a form of his later thesis of the identity of indiscernibles (Section 6). He asserts, too, that there can be no purely extrinsic denominations (Section 9), which leads him to say that all things are in a sense contained in all things; there is also a hint (Section 9) of his later thesis that each substance expresses the entire universe. Again, he asserts in the *De Summa Rerum,* as he often did later, that the entire effect is equipollent to the full cause (Section 9). Finally, there is a suggestion of the important idea that the only genuine entities are minds, or at any rate mind-like (Section 6). Connected with this is the view (Section 6) that the unity that bodies have is provided by a mind; this is perhaps a forerunner of Leibniz's later views about the importance of the concept of a substantial form.

Such is the philosophical system that is contained (in a less than fully worked-out form) in the writings presented in this volume. But although

many of the important propositions of Leibniz's later philosophy are to be found in the *De Summa Rerum,* some are not. It was mentioned earlier in this section that at the time of the *De Summa Rerum* Leibniz had not yet developed his mature concept of force. For those scholars who regard Leibniz's dynamics as of primary importance in his metaphysics,[141] this must mean that the very foundations of Leibniz's distinctive philosophy were not yet in place by the end of 1677. But even if one does not accept this view of the place of dynamics in Leibniz's metaphysics, one must admit that what might in a general sense be called the "dynamic" character of Leibnizian substance—the fact that it is "big with the future and laden with the past"—is missing from the *De Summa Rerum.* The work may contain some indications of the concept of a substantial form (cf. Section 6), but only in connection with a substance's unity and not with its dynamic character. Another topic which Leibniz discussed at length in his later works, but on which the *De Summa Rerum* has almost nothing to say, is that of the relation between mind and matter. In Leibniz's mature philosophy, the answer to this problem forms part of the answer to the wider problem of how any created substance can act on any other. Leibniz's solution take the form of the assertion that substances strictly speaking do not act on each other, but that they express each other, and that they do so because God has pre-established a harmony between their mutually independent activities. In the *De Summa Rerum* there are only a few pointers toward this solution. Leibniz does say at one point that it is not necessary that we act on others, or that others act on us (Section 5, p. xxix); he also says that each mind perceives whatever happens in the world, which has some relation to the thesis that each substance expresses the entire universe (Section 10, p. xlvi). He says, too, that each substance is a "complete being," for the perfect understanding of which the understanding of nothing else is required (Section 9, p. xlii). But there is no hint of the way in which the relation between substances is to be explained.

Perhaps the most striking gap in the *De Summa Rerum* is the absence of any reference to the notion—central to the *Discours de Métaphysique* of 1686 and associated works—that a substance has a complete concept, which serves to individuate it. Absent, too, is any reference to the theory of truth from which this notion is derived: that is, the theory that in every true proposition the concept of the predicate is contained, expressly or implicitly, in that of the subject. It might perhaps be replied that the absence of this theory, or of the notion of a complete concept which is derived from it, is not of the greatest importance. For in Leibniz's metaphysical works of 1695 and after, such as the *Système Nouveau* and the *Monadology,* logical considerations of the kind just described are not

present; instead, the emphasis is on the unity of a substance. The issue will not be discussed here; it is sufficient, as far as the present work is concerned, to say that if one is looking for the ancestry of the thesis that a substance has a complete concept, one cannot trace it back as far as the *De Summa Rerum*.[142]

Chronological Table

One aim of the introduction has been to situate the *De Summa Rerum* within the context of Leibniz's work as a whole. The purpose of this table is to provide the reader with a survey of the books, papers, and letters by Leibniz that are referred to in the introduction and in the notes. To place these within a wider context the list has been expanded to include important philosophical works not mentioned in this volume; these are indicated by the use of italic type.

The table is divided into two columns. The left-hand column contains works by Leibniz which can be dated to within a period of twelve months. The letter "P" following a title indicates that the work in question was published by Leibniz. The right-hand column contains unpublished works which can at present be dated only approximately. One may hope for greater precision when these works are published in the Academy Edition; in the meantime, perhaps a rough guide is better than no guide at all.

References to editions of Leibniz are as indicated in the list of abbreviations, with one addition; in the entries for 1675 and 1676, the letter "Y" followed by a number indicates the number assigned to a paper in the present volume.

1663

De principio individui P
A VI.1, 3–19; GP IV, 15–26

1664

Specimen quaestionum philosophicarum ex jure collectarum (1st ed.) P
A VI.1, 69–95

1665

1666

De arte combinatoria P
A VI.1, 163–230; GP IV, 27–104

1667

1668

Letter to Thomasius (October)
A II.1, 10–11; GP I, 9–11

1669

Letter to Thomasius (30 April)
A II.1, 14–24; GP I, 15–27

De incarnatione Dei (1669–70?)
A VI.1, 532–35

Confessio naturae contra atheistas
P
A VI.1, 489–93; GP IV, 105–10
Specimen quaestionum philosophicarum ex jure collectarum (2nd ed.) P
A VI.1, 69–95
De rationibus motus (summer 1669–early 1670?)
A VI.2, 157–76
De vi persuadendi. De somnio et vigilia (1669–summer 1670?)
A VI.2, 276–78

1670

Preface to an edition of Nizolius P
A VI.2, 401–32; GP IV, 127–62
Letter to Chapelain ? (1st half of 1670?)
A II.1, 50–56
Elementa juris naturalis (1670–71?)
A VI.1, 459–85
De materia prima (1670–71?)
A VI.2, 279–80

1671

Letter to Johann Friedrich (21 May)
A II.1, 105–10
De resurrectione corporum (May)
A II.1, 115–17
Letter to Magnus Wedderkopf (May?)
A II.1, 117–8
Hypothesis physica nova P
A VI.2, 219–57; GP IV, 177–219
Theoria motus abstracti P
A VI.2, 258–76; GP IV, 221–40
Letter to Arnauld (November)
A II.1, 169–81; GP I, 68–82
Letter to Magnus Hesenthaler
A II.1, 199–201
De conatu et motu, sensu et cogitatione
A VI.2, 280–87

Hypothesis de systemate mundi
A VI.2, 293–99
De natura rerum corporearum
(2nd half of 1671?)
A VI.2, 300–09
Summa Hypotheseos physicae
novae (2nd half of 1671?)
A VI.2, 326–78
Demonstratio propositionum
primarum (autumn 1671–early
1672?)
A VI.2, 479–86
Table of definitions (2nd half of
1671–early 1672?)
A VI.2, 487–510
Wilhelmus Pacidius (2nd half of
1671–early 1672?)
A VI.2, 510–13)

1672

Propositiones quaedam physicae
(early 1672–autumn 1672?)
A 4–72
Demonstratio substantiarum
incorporearum (autumn?)
A 73–93
Letter for Gallois (end of 1672)
A II.1, 222–29
Confessio Philosophi (autumn
1672–winter 1672–73?)
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De Summa Rerum

461 December 1675.

Sunt propositiones quae magnam habent speciem, ubi excutiantur prope identicae sunt, ut cum legerem in Mercatoris *Logarithmotechnia* tertium quemque numerum si inde ab unitate sumantur, Trinionis multiplum esse. ⟨N⟩otavi propositionem quasi theorema perelegans. Re inspecta vidi id per se patere, et in quolibet numero esse verum, imo nihil aliud esse, Ternarium esse seu Ternionis multiplum esse, quam esse tertium quemque. Nota re hoc modo ad ordinem translata fingi possunt ingeniosae quaedam, ut si in longa serie sumas secundum quemque, mox tertium quemque, inde quartum quemque, incipiendo semper a primo, et numerando etiam ablatis aliquibus per loca vacua; vel etiam relictis, ut si problema sit primum secundo cuique, inde tertio cuique, mox quarto cuique, inde quinto cuique ictum infligere; quaeritur quo te loco collocare debeas, ut quam minimum percutiaris, respondetur, elige numerum primum, ita nunquam attingeris, v. g. 13.

462 Differentia inter processum per ideas, et processum per definitiones, vel characteres, definitio enim characteris explicatio est. Omnis processus per definitiones continet in se processum per ideas. Suppono enim qui loquitur cogitare. Processus per definitiones addit processui per ideas, ut cogitatio fiat fixa; ut nobis ipsis aliisque semper patere possit; ut totus noster cogitandi processus uno obtutu perspici possit. Definitionum connexio facit demonstrationem. Ita est definitionum processus ad processum per ideas; ut processus per delineationes, ad processum per simplices imaginationes; quae vagae per se hoc modo figuntur. Cum per imaginationes aut ideas procedimus, sine delineationibus aut definitionibus: fallimur a memoria, videmurque nobis saepe praetitisse quae non fecimus. Et in eo omnis error, procedimus per analogias, de applicatione ad rem praesentem saepe non soliciti. Ut cum dico $\sqrt{-1}$ est quantitas possibilis, procedo per quasdam analogias.

Cum cogito aliquid quo majus cogitari non potest, quid aliud cogito quam separatim, ideas singulorum quae sub his vocibus continentur, ut aliquid, majus, cogitari, non, posse. Separatim habeo ideam, eius quod voco aliquid; eius quod voco majus, eius quod voco cogitationem, itaque

1. On Mind, the Universe, and God

A, No. 57

461 December 1675[1]

There are some propositions which are very high-sounding but which, when they are examined, are not far from identical propositions. For example, I have read in Mercator's *Logarithmotechnia*[2] that every third number, starting from one, is a multiple of three. I noted this proposition as, so to speak, an elegant theorem; but on looking into the matter I saw that it is self-evident, and is true in the case of any number. For to be a ternary number—i.e., a multiple of three—is simply to be every third number. When what has been recognised in this way is transferred to ordinal numbers, one can construct some ingenious propositions. For example, suppose that in a long series you take every second item, then every third, and then every fourth, starting always from the first, and suppose that you also number the empty spaces (if some items are taken away) as well as the items that are left. Suppose that the problem is this. The first inflicts a blow on each second item, then on each third, then on each fourth, and then on each fifth. The question is, where you should place yourself so that you are hit least. The answer is: choose a prime number—e.g., 13—and so you will never be hit.

462 There is a difference between a procedure[3] by means of ideas and a procedure by means of definitions or symbols; for a definition is an explanation of a symbol. Every procedure by means of definitions contains in itself a procedure by means of ideas; for I assume that the person who speaks, thinks. What procedure by means of definitions adds to procedure by means of ideas is that thought becomes fixed, so that it can always be accessible to ourselves and to others, and so that the whole of our thought procedure can be seen at a glance. A connection of definitions makes a demonstration.[4] A procedure by definitions is to a procedure by ideas as a procedure by drawings is to a procedure by mere imaginations which, being inconstant in themselves, are fixed in this way. When we proceed by imaginations or ideas, without drawings or definitions, we are deceived by the memory, and we often seem to ourselves to have achieved what we have not done. And in this there lies every kind of error; we proceed by analogies, often not troubling ourselves about their application to the present case. Thus, when I say that $\sqrt{-1}$ is a possible quantity, I proceed by certain analogies.

When I think of something than which a greater can not be thought, I think of something different from when I think separately of the ideas of the individual things that are comprehended under these words, namely "something," "greater," "be thought," "not," "can." I have separately the idea of that which I call "something," of that which I call "greater,"

unum post alterum cogitans; non ideas horum inter se sed postea vocabula tantum seu characteres conjungo et fingo me ideam habere eius quo majus cogitari non potest; quasi scilicet omnia haec simul cogitem. In quo decipimus et decipimur, et hoc est origo erroris de ideis. Habemus ideas simplicium, habemus tantum characteres compositorum. Quod si una possemus cogitatione complecti, id quo majus cogitari non potest, haberemus ideam maximi. Et si possemus cogitare, id quo potentius cogitari non potest, haberemus ideam potentissimi; et si id quo pulchrius cogitari non potest, haberemus ideam perfecti.

Non ergo sequitur[,] ideas habemus eorum quae definitionem alicuius rei ingrediuntur, ergo ideam habemus totius; nisi omnes simul cogitare possimus. Ideam habemus eius quod vocamus Ego, quod vocamus cogitationem, quod vocamus voluptatem, et dolorem, quod vocamus idem, et diversum; item extensionis, et mutationis, sed non habemus ideam Dei, quocunque eum modo definiamus. Et hoc facit, ut non possimus facile judicare de rei possibilitate, ex cogitabilitate eius requisitorum, quando
463 singula eius requisita cogitavimus, neque in unum conjunximus. Quoniam autem non possumus in unam conjungere cogitationem ideas diversas, etsi ope caracterum unire possimus, et cogitationum diversarum seriem totam simul repraesentare, ideo non possumus judicare de impossibilitate cogitando, nisi singulas ideas simul repraesentemus nobis; quod non potest fieri nisi *sentiendo* sive imaginando simul caracteres omnium, quod fit characteribus repraesentatis imaginationi illis, qui sunt singuli caracteres ideae unius. Et quoniam aliquando tantus est caracterum numerus ut totus imaginationi obversari non possit, opus est delineatione in materia; ut ordine examinantes, certi interim simus dum ad posteriora progredimur priora non elabi. Itaque nulla est in nobis *idea* circuli, ut in Deo est, qui omnia simul cogitat. Imago aliqua circuli est in nobis; est et definitio circuli, et ideae sunt in nobis eorum, quae ad circulum cogitandum necessaria sunt. Cogitamus de circulo, demonstramus de circulo, cognoscimus circulum: essentiam eius habemus cognitam; sed per partes. Si essentiam circuli totam simul cogitaremus, haberemus circuli ideam. Solius Dei est ideas habere rerum compositarum. Interea essentiam circuli

and of that which I call "thought"; and so I think of one after the other. Later, I do not join the ideas of these things to one another, but I join only the words or symbols, and I imagine that I have the idea of that than which a greater can not be thought—as if I were thinking of all these at the same time. In this, we deceive and we are deceived, and this is the origin of error about ideas. We have the ideas of simples, we have only the symbols of composites. But if we could grasp in one thought that than which a greater can not be thought, we would have the idea of the greatest. And if we could think of that than which something more powerful can not be thought, we would have the idea of the most powerful; and if we could think of that than which something more beautiful can not be thought, we would have the idea of the perfect.

So it does not therefore follow that, when we have the ideas of those things that enter into the definition of some thing, we thereby have the idea of the whole—unless we can think of them all at the same time. We have the idea of that which we call "I," of that which we call "thought," of that which we call "pleasure" and "pain," of that which we call "same" and "different," and also of extension and change. But we do not have the idea of God, however we define him. And this brings it about that we cannot easily judge about the possibility of a thing from the fact that its requisites[5]
463 can be thought, when we have thought of the requisites individually and have not joined them into one. But since we cannot join different ideas together into one thought (even though we can unite them with the help of symbols) and cannot represent a whole series of different thoughts at the same time, it follows that we cannot judge about impossibility by thinking, unless we represent to ourselves individual ideas at the same time. And this cannot happen unless we *sense* or imagine the symbols of all of them at the same time, which is done by representing to the imagination those symbols, each of which is a symbol of one idea. And as the number of symbols is sometimes so great that the entire number cannot present itself to the imagination, a material delineation of them is required—so that, when we examine them in order, we are certain in the interim that the earlier ones have not slipped away as we proceed to the later ones. And so we do not have any *idea* of a circle, such as there is in God, who thinks all things at the same time. There is in us an image of a circle, and also the definition of a circle, and there are in us the ideas of those things which are necessary for a circle to be thought. We think about a circle, we provide demonstrations about a circle, we recognise a circle: its essence is known to us—but only part by part. If we were to think of the whole essence of a circle at the same time, then we would have the idea of a circle. Only God has the ideas of composite things; in the meantime, we know the essence

cognoscimus, cogitando eius requisita per partes. Ideae defectum in nobis supplet imago aliqua sensibilis, aut definitio; sive aggregatum characterum, in quibus nulla opus est similitudine. Semper ideae locum supplet phantasma aliquod quod totum simul sentitur. Imagines sensus excitant, characteres cogitationem: illae ad operandum, [hi] ad ratiocinandum aptiores.

Ideam negativorum quomodo aliquis habebit; ut maximi seu quo magis cogitari non potest?

Numerus omnium numer[or]um est contradictorium, seu sine idea, quia alioqui sequetur totum esse aequale parti, seu tot esse numeros, quot sunt numeri quadrati.

Motus celerrimus est notio impossibilis, potest enim demonstrari ex dato motu celerrimo sequi celeriorem. Quia numerus omnium numerorum est contradictorium, patet omnia intelligibilia non posse totum constituere. Foret enim eius partium multitudo numerus. Numeri, modi, relationes non sunt Entia.

Impossibilis duplex notio, id quod Essentiam non habet, et id quod Existentiam non habet seu quod nec fuit nec est nec erit, quod incompatibile est Deo, sive Existentiae sive rationi quae facit ut res sint potius
464 quam non sint. Videndum an demonstrari possit esse Essentias quae Existentia careant. Ne quis dicat nihil concipi posse quod non aliquando futurum sit in tota aeternitate. Omnia quae sunt erunt et fuerunt totum constituunt. Quicquid necessario incompatibile est, impossibile est. Ratio quae facit ut illud potius quam aliud sit. Duplex origo impossibilita[ti]s, una ab essentia, altera ab existentia seu positione. Prorsus quemadmodum duplex ratio facit problemata impossibilia, una cum resolvuntur in aequationem contradictoriam, altera cum resolvitur in imaginariam quantitatem, cuius nullus intelligi potest situs. Egregium hoc simulacrum eorum quae nec fuere nec sunt nec erunt. Propositio haec necessaria est: Quicquid futurum est id futurum est. Factum infectum reddi non potest. Impossibile est Petrum non fuisse. Ergo Petrum fuisse necessarium est. Ergo praeterita Petri existentia necessaria est. Eodem modo demonstrabitur; Extremum iudicium venturum propositio necessaria est, sed est in his lusus.

Cum somniamus palatia, ea existere recte negamus. Existere ergo non

of a circle by thinking of its requisites part by part. The deficiency of the idea that we have is made good by some sensible image, or by a definition; that is, by an aggregate of symbols, in which there is no need of similarity.[6] The place of an idea is filled on each occasion by some phantasm, the whole of which is sensed at the same time. Images excite the senses, symbols excite thought; the former are more suitable for action, the latter for reasoning.

How will anyone have the idea of negatives, such as that of the greatest, i.e., of that than which a greater[7] can not be thought?

The number of all numbers is a contradiction, i.e., there is no idea of it; for otherwise it would follow that the whole is equal to the part, or that there are as many numbers as there are square numbers.

The most rapid motion is an impossible concept, for it can be demonstrated that from a given most rapid motion there follows a more rapid motion.[8] Since the number of all numbers is a contradiction, it is evident that all intelligible things cannot constitute a whole. For the multitude of its parts would be a number. Numbers, modes, and relations are not entities.

"Impossible" is a two-fold concept: that which does not have essence, and that which does not have existence, i.e., that which neither was, is, nor will be because it is incompatible with God, or, with the existence or reason which brings it about that things exist rather than do not exist. One
464 must see if it can be proved that there are essences which lack existence, so that it cannot be said that nothing can be conceived which will not exist at some time in the whole of eternity.[9] All things which are, will be, and have been, constitute a whole. Whatever is incompatible with what is necessary is impossible.[10] There is a reason which brings it about that this, rather than something else, exists. The origin of impossibility is two-fold: one from essence, the other from existence or, positing as actual. In the same way, there is a two-fold reason for impossible problems: one, when they are analyzed into a contradictory equation, and the other, when there is an analysis into an imaginary quantity, for which no place can be understood. This is an excellent image of those things which neither have been, nor are, nor will be. This proposition is necessary: "Whatever will be, will be."[11] Whatever has been done cannot be undone. It is impossible that Peter did not exist, therefore it is necessary that Peter existed, therefore the past existence of Peter is necessary. In the same way it will be demonstrated that it is a necessary proposition that the last judgement will come. But there is something frivolous in all this.

When we dream of palaces, we rightly deny that they exist. Therefore it is not the case that to exist is to be sensed. The distinction between our true

est sentiri; Sensionum nostrarum verarum a falsis nullum est aliud discrimen, quam quod sensiones verae sunt consentientes, seu quod praedictiones de iis nostrae verae sunt; ut de Eclipsibus. Sensio non est rerum existentia, quia fatemur existere quae non sentiuntur. Deinde ipsa sensionum cohaerentia debet ab aliqua oriri causa. Existentia ergo est qualitas subjecti, qua fit ut cohaerentes habeamus sensiones. Unde intelligi potest etiam existere quae non sentiuntur, cum qualitas illa existere possit, etsi ob nostrum defectum, non sentiatur res. Ipsas existere sensiones nobis est indubitatum. Ergo et sentiens, et sensionis causam. Sensiones existere an per se notum? quae ergo notio communis ob quam tam sensiones nostras quam objecta dicamus existere. Videmur probare rerum existentiam, quatenus ex nostris sensionibus necessaria vel probabili consequentia sequuntur. Supponimus ergo tum sensiones nostras existere, tum id quod ex ipsis sequitur existere. Est ergo existere ex sensione consequi. Possumus dicere sentiri etiam quae per consequentiam sentiuntur. Sed melius dicemus sentiri a nobis palatium quod somniamus vel videmus.

Cum cogitamus cogitationem aliud cogitamus quam cum figuram et
465 motum. Cogitatio non est consequentia extensionis. Non aeque certum, quod extensio non sit consequentia cogitationis. Id est propositio haec non est necessaria[:] omne extensum est cogitans. Spatium eiusve pars non possunt cogitare. Id cuius natura in eo consistit ut cum alio simili in eodem spatio esse non possit, non posse cogitare, non aeque demonstrabile. Videtur demonstrabile, quod quicquid habet partes separabiles non possit cogitare.

Si linea maxima quae a dato puncto per datum punctum duci possit, est quantitas, sequitur esse medium in linea maxima utrinque producta. Imo hinc sequitur esse aliquod totius spatii punctum medium. Itaque hoc modo universum habebit centrum, et diametros, sed fine carentes. A dato puncto ad datam rectam non potest duci maxima recta. Eodem modo quo medium est punctum in universo, erit et medium punctum in aeternitate. Quaeritur an hoc punctum medium jam transierit; et quanto hinc absit intervallo. In medio universi puncto, medio aeternitatis instanti nostra fieri necesse est. Potest fieri ut medium aeternitatis punctum hinc absit tempore infinito; et medium spatii linea infinita. Veniente medio aeternitatis puncto dici posset de Deo, eum dimidiam suae vitae partem transegisse.

and false sensations is simply that true sensations are consistent, or, that our predictions about them are true, such as our predictions about eclipses. Sensation is not the existence of things, because we declare that there exist things which are not sensed. Further, the coherence of sensations must itself spring from some cause. Existence, therefore, is the quality of the subject which brings it about that we have coherent sensations. From this it can be understood that there also exist things which are not sensed, since that quality can exist even if (because of our own deficiency) the thing is not sensed. That sensations themselves exist is something that we do not doubt—and therefore we also do not doubt that there is a sentient being, and a cause of sensation. Is it self-evident that sensations exist? This will therefore be a common notion,[12] on account of which we say that both our sensations and objects exist. We appear to prove the existence of things in so far as they follow from our sensations as either a necessary or a probable consequence. We assume, then, both that our sensations exist and that what follows from them exists. Thus it is that existing follows from sensation. We can say that those things which are sensed as a consequence are also sensed. But it is better to say that what is sensed by us is the palace which we dream or see.

When we think of thought we think of something other than what we think of when we think of shape and motion. Thought is not a consequence
465 of extension; it is not equally certain that extension is not a consequence of thought. That is, the proposition "Everything extended is thinking" is not necessary. Space, or a part of space, cannot think. It is not equally demonstrable that that whose nature consists in the fact that it cannot exist in the same space as something else that is like it, cannot think. It seems to be demonstrable that whatever has separable parts cannot think.

If the greatest line that can be drawn from a given point through a given point is a quantity, it follows that the greatest line, produced in both directions, has a middle. Indeed, from this it will follow that there is some mid-point of the whole of space.[13] In this way the universe will have a centre and diameters, though the latter will be without end. From a given point to a given straight line,[14] a greatest straight line cannot be drawn. In the same way in which there is a mid-point in the universe, there will also be a mid-point in eternity. One asks whether this mid-point has already passed, and how long ago. It is necessary that our affairs take place in the mid-point of the universe,[15] and in the middle instant of eternity. It is possible that the mid-point of eternity is distant from us by an infinite time, and that the middle of space is distant from us by an infinite line.[16] When the mid-point of eternity comes, it can be said of God that half of his life has passed.

An Deus sit mens, et an Deus afficiatur voluptate? Deus intelligit, quia agit in se ipsum. Agit autem in se ipsum, quia est causa sui. Caeterae mentes se non producunt, etsi se mutent. Deus conservat se ipsum, etsi continue non reproducat; videndum an conservatio continua productio.

2. De Materia, De Motu, De Minimis, De Continuo

466 Decembr. 1675

Esse nihil aliud esse quam percipi posse, sequitur ex quibusdam ratiocinandi modis. Ut si dicam omnia in certam quandam plagam moveri; idem est ac si dicam omnia quiescere. Si dicam omnia majori quam nunc celeritate proportione moveri, nihil reapse immutatum erit. Si in Spatio loco extensi imaginer fluidum quiescens perfectum, quod corpore alio in [eo] natante moveatur ad locum replendum, nihil aliud quam spatium vacuum dico. Esset Materia, si eius motu corporis motus retardaretur.

Subtilissimae Geometriae res est exquirere quomodo fiat, quibus lineis circulationum, ut liquidum anterius redeat ad locum corporis posterioris. Examinandum qua quodlibet punctum linea feratur, ut demonstretur quodlibet punctum alia atque alia linea ferri, quo posito sequetur absurdum scilicet continuum componi ex minimis. Unde rursus sequetur liquidum perfectum esse impossibile, quod omnia repleat, sive spatium vacuum intelligi debere. Examinanda tamen prius illa demonstratio est eiusque absurditas; antequam dicatur perfectam fluiditatem implicare, vel ideo quia non videtur intelligi posse differentia inter modum explicandi per fluidum et per spatium.

Eandem motus quantitatem servari, sive si corporis movendi magnitudo augeatur celeritatem diminui, quae a Galilaeo et Cartesio et Hobbesio, imo et Archimede observata sunt, res est ex phaenomenis ducta, sed cuius originem in ipsa natura ostendit nemo. Hoc scilicet praejudicio quasi quodam sumimus, maius corpus difficilius moveri, quasi ipsa materia motui resistat. Quod repugnat, indifferens est enim materia ad quemlibet locum, adeoque et ad mutationem loci, sive motum. Cartesius confugit ad immutabilitatem Dei; debebat appellare harmoniam rerum

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Is God a mind, and is God affected by pleasure? God understands, because he acts on himself. But he acts on himself because he is the cause of himself. Other minds do not produce themselves, even though they change themselves. God conserves himself, even though he does not reproduce himself continuously; one must see whether conservation is continuous production.

2. On Matter, Motion, Minima, and the Continuum

A, No. 58

466 December 1675[1]

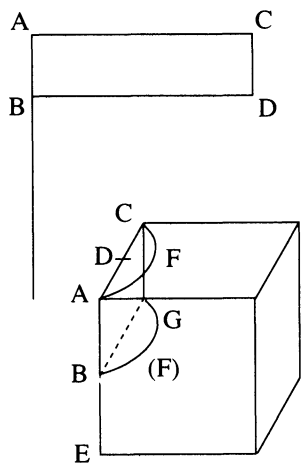
There are some ways of reasoning from which it follows that to be is simply to be capable of being perceived.[2] For example, if I say that all things are moving in a certain fixed direction, it is the same as if I were to say that all things are at rest.[3] If I say that all things move in proportion with a greater speed than they do now, nothing will really have changed. If I imagine in space, instead of extension,[4] a perfectly quiescent fluid which, when some body swims in it, is moved to fill its place, then I am simply saying that space is a vacuum. It would be matter, if the motion of a body were retarded by its motion.

It is the concern of a most subtle geometry to inquire how, and by what lines of circulation, it comes about that a liquid returns to fill the place left by a body. One must examine along what line each point is moved, in order to prove that each point is moved now along one line, now along another—granted which something absurd will follow: namely, that a continuum is composed of minima. From this it will also follow that it is impossible that there should be a perfect liquid[5] which fills all things, i.e., it will follow that space has to be understood to be a vacuum. But before it is said that perfect fluidity implies a contradiction,[6] one must first examine that demonstration[7] and its absurdity. Another reason for rejecting perfect fluidity is that the difference between a method of explanation by a fluid and by a space does not seem to be intelligible.

That the same quantity of motion is conserved, or, that if the size of a moving body is increased its speed is diminished, has been noted by Galileo, Descartes, and Hobbes, and indeed by Archimedes.[8] This is something that has been derived from phenomena, but no one has shown its origin in nature itself. We have assumed, by a kind of prejudice, that a greater body is moved with more difficulty, as if matter itself resisted motion. But this is contrary to reason, for matter is indifferent towards any place whatsoever, and therefore to change of place, i.e., motion. Descartes takes refuge in the immutability of God;[9] but he should have ap-

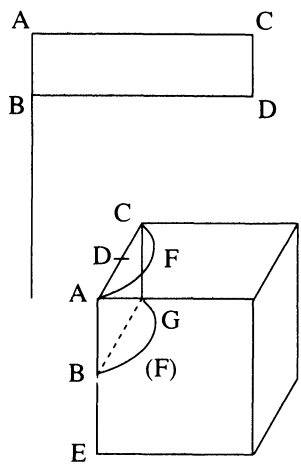
Dei, simplicissima enim eligere ad maxima praestanda sapientissimi est. Sed difficile erit ostendere consentaneum esse harmoniae rerum, ut
467 servetur eadem quantitas motus in toto mundo. Forte enim intererat harmoniae rerum. Quoniam contra videtur consentaneum varietati rerum, ut in aliis atque aliis systematis, aliae atque aliae leges motus habeantur. Quod si vero ostendatur necessariam esse quantitatem motus ex ipsa materiae et pleni [natura] facilius concedetur, quod desidero. Nam plenitudinem mundi esse consentaneam harmoniae rerum utique concedetur. Aliquam enim partem loci inutilem sine necessitate relictam esse intelligi non potest. Plena autem esse omnia intelligo, id est materia varie mota, nam si tota quaedam massa infinita intelligatur universali quodam motu ferri, is motus poterit haberi pro nullo. Posita ergo plenitudine rerum, seu posito nullam esse spatii partem, in qua non sit materia quae feratur motu ab infinitis aliis diverso; ita ostendo eandem motus quantitatem servari.

Fingamus aliquamdiu eandem servari quantitatem, et tempus vocemus AB, spatium autem quod eo tempore materia percurrit ABCD, intelligendo scilicet unumquodque punctum materiae assignabile eo tempore durante certam spatii partem percurrisse. Unde ut rectius dicam fiat quasi solidum.



pealed to the harmony of the works of God,[10] for the wisest being chooses the simplest means to achieve the greatest results. But it will be difficult to show that it is consistent with the harmony of things that the same quantity
467 of motion should be preserved in the entire world, on the grounds that that was perhaps important to the harmony of things. On the contrary, it appears consistent with the variety of things that in different systems, different laws of motion should hold. But if it is shown from the very nature of matter and of the plenum that the quantity of motion is necessary, then what I want will be granted more readily. For it will at least be granted that the plenitude of the universe is consistent with the harmony of things. For it is not intelligible that some part of a region should have been left useless, unless this were necessary. Now, I take it that all things are full, that is, that they are matter moved in various ways. (For if some entire infinite mass were understood to be moved with some motion which is the same for all, that motion should be regarded as null.)[11] So, the plenitude of things being granted—i.e., it being granted that there is no part of space in which there does not exist matter which is moved with a motion which is different from an infinity of others—I show that the same quantity of motion is conserved.

Let us suppose that for some time the same quantity is conserved, and let us call the time AB, and the space which matter traverses in that time ABCD—understanding that each assignable point of matter during that time has traversed a certain part of space. To speak more precisely: let there be a kind of solid,

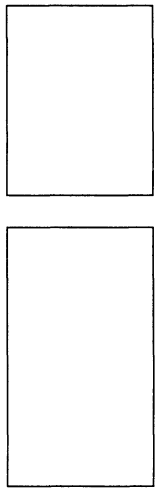


Sit tempus licet portio abscissa ex latere cubi, AE, nempe ipsa AB. Recta autem AC, aliud cubi latus perpendiculare priori repraesentet materiam. Ipsi AC perpendiculariter insistant rectae DF, quae repraesentent celeritates cuiuslibet materiae partis, seu infinitesimas spatiorum, a quolibet determinato tempore percurrendorum. Et spatium totum a materia percursum erit quasi cylindrica portio AFCG(F)BGCA. Quod si jam una materiae pars celerius quam ante moveri incipiat, sequetur eam durante tempore AB plus spatii occupasse, quam alioqui occupasset. Definitum autem est spatium mundi, sive certum ac determinatum, etiamsi infinitum ponatur, et si omnia sint plena, non poterit aliquod maius occupasse spatium quam ante, nisi aliud minus occupet spatium quam ante, alioquin corpora se penetrare intelligentur. Quare non poterit aliquid moveri celerius quam ante, nisi aliud moveatur tardius quam ante, quantum satis est, ut eodem tempore tota materia tantundem spatii occupasse intelligatur. Id est, eadem servabitur quantitas motus in summa, cum quantitas
468 motus in summa eadem sit cum quantitate spatii determinato tempore successive occupati a determinata materiae quantitate. Nimirum in eo consistit natura motus, ut nulla sit temporis pars tam parva, quin in ea corpus in pluribus sit locis successive. Necesse est ergo si omnia sint plena, alia etiam ei cedere successive. Si quid plura successive loca occupavit, et aliud etiam plura successive loca occupavit, denique si summa omnium locorum successive a singulis corporis partibus occupatorum in unum colligatur, prodibit spatium totum repetitum eo saepius, quo maius sumtum est tempus; neque vero fieri potest ut maior minorve aequalibus temporibus oriatur spatiorum occupatorum summa, quia tunc distributione facta necesse fuisset, plus materiae pro eo quod superest spatio implendo accersi, aut aliquid materiae ejici, quae omnia fieri non posse supponimus.

Illud hic notabile est ad reddendam demonstrationem exactiorem, quod aliunde ostendi potest, summam motus non posse diminui, vel ideo quod omnia necessario flexilia sunt. Consideranda hic res, quomodo possibile sit perfecte rectilinea si flectere,

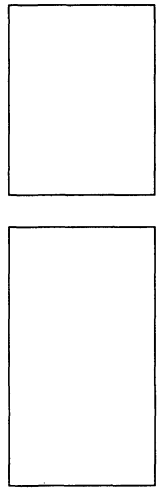
and let the time be a portion cut off from the side of the cube AE, namely AB. Let the straight line AC, another side of the cube perpendicular to the former, represent matter. Let there impinge on AC the straight lines DF, which are perpendicular to it; these represent the speeds of any part of matter, or, the infinitesimal parts of the spaces to be traversed in any determinate time. The entire space traversed by the matter will be the portion of a cylinder, AFCG(F)BGCA. Now, if one part of matter begins to move more quickly than before, it will follow that during the time AB it has occupied more space than it would otherwise have occupied. But the space of the world is definite, i.e., certain and determinate, even if it is assumed to be infinite; and if all things are full, something cannot have occupied more space than before unless something else occupies less space than before, for otherwise bodies would be understood to penetrate each other. Therefore something cannot be moved more quickly than before unless something else moves more slowly than before—as much as is sufficient for the whole of matter to be understood to have occupied just so much space at the same time. That is, the same quantity of motion will
468 be preserved in the whole, since the quantity of motion in the whole will be the same as the quantity of space occupied successively at a determinate time by a determinate quantity of matter. For the nature of motion consists in this: that there is no part of time so small but that in that part a body is in several places successively. It is necessary, therefore, that if all things are full, other things give way to the body successively. If something has occupied several places successively, and something else has also occupied several places successively, and finally if the sum of all the places that are successively occupied by the individual parts of a body is collected into one, the whole space will turn out to have been retraced the more often, the greater the time that is taken. Nor can it happen that in equal times there can arise a greater or less sum of spaces occupied; for then, when the distribution has been made, it would have been necessary for more matter to have been added to fill the space that remains, or for some matter to have been ejected—all of which we have supposed not to be possible.

But it is worth noting here, for the sake of a more exact demonstration, that it can be shown from other considerations—or rather, on the basis of the fact that all things are necessarily flexible—that the sum of motion cannot be diminished. Here we have to consider how it is possible for two perfectly rectilinear bodies to bend each other; for there is no



nulla est enim ratio, cur in hanc quam illam se potius partem flectant. Itaque posito concursu duorum perfecte rectilineorum homogeneorum, sequetur tunc motum perditum iri, adeoque turbari totam harmoniam rerum. Responderi potest quidem talia corpora nec fuisse nec esse nec fore, sed hoc nondum satisfacit menti. Certe enim adhuc possibile manet tale corpus. Fingamus enim id existere, sequetur inde impossibile, ut nos supponimus, scilicet mutatio quantitatis motus. Ergo non Elaterium, sed haec conservatio quantitatis est vera causa generalis. Quoniam haec causa generalis, etiam ipsius Elaterii est. Duo in hac consideratione notabilia unum, quomodo differant impossibilia, ab iis quae nec sunt nec erunt nec fuerunt; alterum, quomodo plures ejusdem rei causae.

Ut res profundius explicetur de relatione inter motum et impletionem spatii, videtur ex iis quae dixi sequi non tantum in tota massa non posse plus minusve motus esse, quia tunc tota massa plus spatii occuparet, sed videtur eodem jure dici posse, quod etiam quaelibet corporis pars celerius quam nunc moveri non possit, quin alternetur, fiatque proinde minus levis, quod experientiae repugnat. Certum est idem corpus plus minusve spatii in dato aliquo tempore occupare posse, quia celerius tardiusve moveri potest. At si omnia sint plena, et corpus aliquod moveatur celerius
469 quam ante; necesse erit aliud corpus moveri tardius quam ante. Nam alioqui corpus unum occupans maius spatium quam ante, et alterum tantundem quantum ante, sequitur utrumque magis quam ante in eodem



reason why they should bend towards this part rather than that. And so, given a meeting of two perfectly homogeneous rectilinear bodies, it will follow that motion is lost, and that as a consequence the entire harmony of things is disturbed. It can be replied that such bodies neither have existed, do exist, or will exist; but this is not intellectually satisfying. For such a body certainly remains possible. Let us suppose, then, that it exists; there follows from this what we have supposed to be impossible, namely a change in the quantity of motion. So it is not elasticity, but this conservation of quantity that is the true general cause. And since it is the general cause, it is also the cause of elasticity itself. Two things are noteworthy in this inquiry: first, the way in which impossible things differ from those which neither are nor will be nor have been.[12] and second, the way in which there are several causes of the same thing.

To explain more deeply the relation between motion and the filling of space: it seems to follow from what I have said not only that there cannot be more or less motion in a whole mass—for then the whole mass would occupy more space—but that it can, it seems, be said with equal justice that any part of a body cannot be moved more quickly than now unless it alternates,[13] and so becomes less light, which is contrary to experience. It is certain that one and the same body can occupy more or less space in a given time since it can be moved more quickly or more slowly. But if all
469 things are full, and some body is moved more quickly than before, it will be necessary for another body to be moved more slowly than before. For otherwise—one body occupying more space than before, and the other as much as before—it follows that each of them was in the same space in a

spatio fuisse; quod est contra ideam impenetrabilitatis qualem corpori dare debemus. Quod si ponamus diminui quantitatem motus, diminuetur et quantitas spatii a materia dato tempore occupati; atqui ea non diminuta est, supererit ergo spatium non occupatum. Illud ergo sufficit pro principio sumi, Naturam materiae sive corporis talem esse, ut iisdem temporibus tantundem spatii occupet.

Motus corporis expansio est, nam quo quid celerius movetur hoc plus spatii occupat tempore aliquo definito. Supposito ergo non posse in pleno corpus unum expandi, quin aliud contrahatur, neque unum contrahi quin aliud expandatur: item non posse expansionem aliam intelligi nisi per motum: Sequitur eandem semper motus quantitatem servari, idem esse quod eandem semper materiae servari quantitatem.

Per idem spatium intra datum tempus plus materiae transire, est materiam moveri celerius, ut scilicet morae parvitate, moles pensetur. Punctum velocitate infinita motum lineam momento implet. Si quid velocitate aliqua moveatur, qua nequeat intelligi major, simul erit ubique.

Minimum tempus (Minimum spatium) est majoris temporis (spatii) intra cuius terminos est, pars. Ex notione quam habemus de toto et parte. Ergo Minimum tempus est minima temporis pars; et minimum spatium est minima spatii pars. Non datur minima spatii pars. Quia alioqui tot essent minimae in diagonali, quam in latere, adeoque diagonalis aequalis lateri, nam quorum omnes partes aequales, ea aequalia. Eodem modo facile demonstratur, nec temporis minimum dari. Si Minimum est alicuius minimum est, minimum erit ergo eorum quae sunt in spatio, vel partium potius spatii, ut a corporibus distinguas. Nec aliter de re poterimus loqui. Posito ergo Minimum [esse], ideoque et momentum et tempus implicare. Omne maius componitur ex aliquo minore. Ergo omne minimum est pars eius majoris intra cuius terminos est.

470 Si continuum aliud est quam summa minimorum (si in eo minima) positorum; sequitur esse partem quae supersit ablata summa minimorum; ergo ea pars est major minimo, cum nec minor sit nec aequalis, ergo et in ipsa sunt minima. Quod est absurdum, cum omnia jam minima ab-

higher degree than before; and this is contrary to the idea of impenetrability that we have to ascribe to a body. On the other hand, if we assume that the quantity of motion is diminished, there will be diminished also the quantity of the space that is occupied by matter at a given time. But that is not diminished, and so there will remain a space that is not occupied. So it is enough to assume this as a principle: that the nature of matter or body is such that it occupies the same amount of space at the same time.

The motion of a body is expansion: for the more quickly a body is moved the more space it occupies at a definite time. Assuming, then, that in a plenum one body cannot be expanded without another being contracted, and that one body cannot be contracted without another being expanded, and also that another expansion cannot be understood except by the aid of motion—assuming all this, it follows that for the same quantity of motion always to be conserved is the same as for the same quantity of matter always to be conserved.

For more matter to pass through the same space within a given time is for the matter to be moved more quickly, so that the mass is compensated by the smallness of the delay. A point, moved with infinite speed, fills a line in a moment. If something is moved with a speed than which no greater is intelligible, it will be everywhere at the same time.

A minimal time (minimal space) is a part of a greater time (space) within whose limits it is. This follows from the concept that we have of whole and part. Therefore a minimal time is a minimal part of time, and a minimal space is a minimal part of space. There is no minimal part of space. For otherwise there would be as many minimal parts in the diagonal as in the side, and so the diagonal would be equal to the side; for those things of which all the parts are equal are themselves equal. In the same way it is easily proved that there is no minimum of time. If a minimum is a minimum of something, then it will be a minimum of those things which are in space (or rather of the parts of space, so that you may distinguish it from bodies). Nor can we speak otherwise about the matter. Granted, therefore, that there is a minimum, it follows that both a moment and time imply a contradiction. Everything greater is composed of something less. Therefore every minimum is a part of that greater thing within whose boundaries it is.

470 If the continuum (if there are minima in it) is other than the sum of the assumed minima, it follows that there is a part which remains when the sum of the minima has been taken away; therefore that part is greater than a minimum, for it is not less than nor equal to a minimum;[14] therefore there are minima in it. But this is absurd, for we have already taken away

stulerimus. Ergo: Si sunt in continuo partes minimae, sequitur continuum ex ipsis componi. Absurdum est autem continuum componi ex minimis, ut demonstravi, ergo et esse Minima in continuo, seu Minima esse continui partes. Esse in aliquo (id est intra terminos) et aliquid sine alio intelligi non posse, est esse partem. Ergo non datur. Hinc si instantia in tempore, non nisi instantia erunt, nec tempus nisi instantium summa.

Ex his jam praeclare demonstrantur: (1) Continuum omne infinitum esse. Nempe supposito corpore moto usque ad extremitates Mundi, incipiet egredi, adeoque spatium ultra est contra hypothesin. (2) Mutationem cessare non posse, seu quicquid movetur, motum iri. Eandem nec incipere posse. (3) Omne corpus moveri. Nam omne corpus mobile est. Quicquid mobile est motum est. (4) Esse in loco est per locum transire, quia momentum nullum; et omne corpus movetur. (5) Materia non potest eodem tempore idem cum alio spatium occupasse. (6) In pleno et spatio certo, si corpus impellat corpus, minuetur eius celeritas. Potius scilicet huic non datur plus motus, quam ut totius massae motus diminuatur. Et hic jam locum habet illud memorabile: quod potius mutatio fiat in magno quam parvo. Hoc scilicet pro principio ponendum est. Si in alterutro fieri mutationem necesse sit, in multis exigua, et in paucis multa, potius mutatio fiet in paucis. Et hoc est principium detrusionis gravium. Quia multiplicatio subjectorum inutilis, rescindatur, et reuniatur potius mutatio in unum.

3. De Arcanis Sublimium Vel de Summa Rerum

472 11. Febr. 1676

Recte expensis rebus, pro principio statuo, Harmoniam rerum, id est ut quantum plurimum essentiae potest existat. Sequitur plus rationis esse ad existendum, quam ad non existendum. Et omnia extitura si id fieri posset. Cum enim aliquid existat, nec possint omnia possibilia existere, sequitur ea existere, quae plurimum essentiae continent, cum nulla sit alia ratio, eligendi caeteraque excludendi: Itaque ante omnia existet Ens omnium possibilium perfectissimum. Ratio autem cur perfectissima ante omnia existant manifesta est, quia dum simplicia simul et perfecta sunt, seu

stulerimus. Ergo: Si sunt in continuo partes minimae, sequitur continuum ex ipsis componi. Absurdum est autem continuum componi ex minimis, ut demonstravi, ergo et esse Minima in continuo, seu Minima esse continui partes. Esse in aliquo (id est intra terminos) et aliquid sine alio intelligi non posse, est esse partem. Ergo non datur. Hinc si instantia in tempore, non nisi instantia erunt, nec tempus nisi instantium summa.

Ex his jam praeclare demonstrantur: (1) Continuum omne infinitum esse. Nempe supposito corpore moto usque ad extremitates Mundi, incipiet egredi, adeoque spatium ultra est contra hypothesin. (2) Mutationem cessare non posse, seu quicquid movetur, motum iri. Eandem nec incipere posse. (3) Omne corpus moveri. Nam omne corpus mobile est. Quicquid mobile est motum est. (4) Esse in loco est per locum transire, quia momentum nullum; et omne corpus movetur. (5) Materia non potest eodem tempore idem cum alio spatium occupasse. (6) In pleno et spatio certo, si corpus impellat corpus, minuetur eius celeritas. Potius scilicet huic non datur plus motus, quam ut totius massae motus diminuatur. Et hic jam locum habet illud memorabile: quod potius mutatio fiat in magno quam parvo. Hoc scilicet pro principio ponendum est. Si in alterutro fieri mutationem necesse sit, in multis exigua, et in paucis multa, potius mutatio fiet in paucis. Et hoc est principium detrusionis gravium. Quia multiplicatio subjectorum inutilis, rescindatur, et reuniatur potius mutatio in unum.

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all the minima. Therefore if there are minimal parts in a continuum, it follows that the continuum is composed of them. But it is absurd that the continuum should be composed of minima, as I have shown; it is therefore also absurd that there should be minima in the continuum, or, that minima should be parts of the continuum. To be in something (i.e., to be within limits) and to be something which cannot be understood without something else, is to be a part. Therefore this is not the case.[15] So if there are instants in time, there will only be instants, and time will only be a sum of instants.

From this there are fine proofs of the following: (1) Every continuum is infinite. For suppose a body to have moved[16] right up to the ends of the world: it will begin to leave it and so there is a space beyond, which is contrary to the hypothesis. (2) Change cannot cease, or, whatever is moved, will be moved. Nor, again, can change begin. (3) Every body is moved; for every body is mobile. Whatever is mobile has been moved. (4) To be in a place is to pass through a place, since there is no moment, and every body is moved. (5) Matter cannot have occupied the same space at the same time as some other. (6) If a body moves a body in a certain plenum and space, then its speed is diminished. That is to say, more motion is not given to this body, rather than that the motion of the whole mass should be diminished. And here this memorable fact has a place: that change takes place in a big thing rather than in a small thing. This is to be regarded as a principle. If it is necessary that there shall be a change in one of the following two ways—a small change in many things, and a great change in a few things—then the change will occur rather in the few things. And this is the principle of the downward thrust of heavy things. Because the multiplication of subjects is useless, let it be annulled, and let change rather be reunited into one.

3. On the Secrets of the Sublime, or on the Supreme Being

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After due consideration I take as a principle the harmony of things: that is, that the greatest amount of essence that can exist, does exist. It follows that there is more reason for existing than for not existing, and that all things will exist, if that can come about. For since something exists, and all possibles cannot exist, it follows that those things exist which contain the most essence, for there is no other reason for choosing some and excluding the rest. Therefore there exists first of all the being which is the most perfect of all possibles. The reason why most perfect beings should

plurimum includunt, plurimis aliis locum relinquunt. Unde unum perfectum praeferendum multis imperfectis aequipollentibus, quia haec aliorum
473 existentiam impediunt, dum occupant locum et tempus.*

Ex hoc principio jam sequitur, nullum esse vacuum in formis; item nullum esse vacuum in loco et tempore, quoad ejus fieri potest. Unde sequitur nec tempus ullum assignabile esse, in quo non fuerit aliquid, nec locum esse, qui non sit plenus. Quoad eius fieri potest. Videndum ergo quid sequatur ex plenitudine Mundi.

Ante omnia autem probabimus necessario praeter fluida etiam existere solida. Sunt enim fluidis perfectiora, quia plus essentiae continent, non tamen omnia possunt esse solida, tunc enim se mutuo impedirent, sunt ergo solida immixta fluidis. Origo solidorum, ex solo fluidorum motu, non videtur explicari posse. Videntur, ut id obiter dicam, omnia solida esse quadam mente informata. Videndum an solida illa saltem flexilia sint, etsi separari non possint, videndum item an non sint corpora, neque solida neque fluida, sed media ex ipsa natura sua. Quod tamen videtur paulo difficilius explicatu.

An videtur rationi consentaneum esse Atomos? Si Atomus aliqua semel substiterit semper subsistet. Statim enim materia liquida circumjacens plena, ipsam dissipare conabitur, quia ejus motum turbat, ut facile ostendi potest. Si quod corpus magnum dissipationi nonnihil resistens, moveatur in liquido, statim formabit speciem terrellae, et vorticem.

Videtur sequi ex solido in liquido, quod materia perfecte fluida sit nihil nisi multitudo infinitorum punctorum, seu corporum minorum quam quae assignari possint, seu quod necessario detur vacuum interspersum, Metaphysicum; quod non pugnat pleno physico. Vacuum Metaphysicum est locus vacuus quantuluscunque modo verus et realis. Plenum Physicum

*Ex eo quod aliquid existit, sequitur eius rei esse aliquam necessitatem, ⟨adeoque⟩ aut omnes res esse necessarias per se, quod falsum, aut certe earum causas ultimas. Unde sequitur Ens absolute necessarium esse possibile, seu non implicare contradictionem. Unde sequitur ipsum existere: Unde videndum jam ⟨an⟩ de eo demonstrari possit esse unicum, etc. Porro quoniam aliqua existunt, et quaedam non existunt, hinc sequitur ⟨existere⟩ perfectissima.

Elementa philosophiae arcanae, de summa rerum, Geometrice demonstrata.

exist first of all is evident: for since they are both simple and perfect, i.e., include the most, they leave room for the greatest number of other beings. Therefore one perfect being is to be preferred to many imperfect beings which are equal in power to it, for the latter impede the existence of others,
473 whilst they occupy place and time.*

It follows from this principle that there is no vacuum among forms; also that there is no vacuum in place and time, as far as that is possible. From which it follows that there is no assignable time in which something did not exist, nor is there a place which is not full—as far as that is possible. One must see, therefore, what follows from the plenitude of the world.

First of all we shall prove that there necessarily exist solids as well as fluids. For the former are more perfect than fluids, since they contain more essence; however, not all things can be solids, for then they would mutually impede each other. Therefore the solids are intermingled with fluids. The origin of solids does not seem to be explicable from the mere movement of fluids. A note in passing: it seems that all solids are informed by a mind of some kind. One must see whether those solids that cannot be separated are at any rate flexible; one must also see whether there exist bodies which are neither solid nor fluid but which, of their own nature, are between the two. But this seems a little more difficult to explain.

Is the existence of atoms consistent with reason? If some atom once existed, it will always exist. For liquid matter which surrounds it and is a plenum will immediately endeavour to break it up since it disturbs its motion, as can easily be shown. If some large body, which resists breaking up to some extent, is moved in a liquid, it will at once form a kind of small sphere and a vortex.[4]

It seems to follow, from the existence of a solid in a liquid, that perfectly fluid matter is nothing but a multitude of infinitely many points, that is, of bodies which are less than any which can be assigned, or, that there necessarily exists an interspersed metaphysical vacuum, which is not inconsistent with a physical plenum. A metaphysical vacuum is an empty place, no matter how small, provided that it is genuine and real. A physi-

*[NOTE BY LEIBNIZ] From the fact that something exists, it follows that there is some necessity for that thing, and so it follows either that all things are necessary *per se*—which is false—or at any rate that their ultimate causes are necessary *per se*. From which it follows that an absolutely necessary being is possible, i.e., does not imply a contradiction; from which it follows that it exists.[1] One must now see whether it can be demonstrated of it that it is unique, etc.[2] Further, since some things exist and some do not exist, it follows that there exist the most perfect.

The elements of an arcane philosophy, concerning the supreme being, geometrically demonstrated.[3]

stat cum vacuo metaphysico inassignabili. Forte ex his sequitur materiam divisam esse in puncta perfecta, seu in omnes partes in quas dividi potest. Unde non sequitur absurdum. Sequetur enim perfecte fluidum non esse continuum, sed discretum, seu punctorum multitudinem. Quare non hinc sequitur continuum componi ex punctis, materia cum liquida non foret verum continuum, etsi spatium sit verum continuum, unde rursus patet, quantum intersit inter spatium et materiam. Materia sola explicari potest multitudine sine continuitate. Et revera Materia videtur esse Ens discretum, nam ⟨etiam⟩ si solida sumatur, tamen quatenus materia est cessante caemento, motu verbi gratia aliove, reducta erit ad statum liquiditatis, seu divisibilitatis, unde sequitur ipsam ex punctis componi. Quod
474 sic probo: omne perfecte liquidum ex punctis componitur. Quia in puncta dissolvi potest. Probo, motu solidi in ipso. Materia ergo est Ens discretum, non continuum, contiguum tantum est, et unitur motu vel a mente quadam.

[Videtur] esse quoddam totius universi centrum, et quendam vorticem generalem infinitum; et quandam Mentem perfectissimam sive Deum. Hanc ut animam totam in toto esse corpore Mundi; huic menti etiam existentiam deberi rerum. Ipsam esse causam sui. Nihil aliud esse existentiam, quam id quod causa est sensuum conformium. Ratio rerum, aggregatum requisitorum omnium rerum. Deum de Deo. Totum infinitum esse unum. Mentes particulares existere summa, ideo tantum, quod summa Ens harmonicum judicat, alicubi esse quod intelligat, sive esse quoddam speculum intellectuale, sive replicationem Mundi. Existere nihil aliud esse quam Harmonicum esse; notam existentiae esse sensus conformes.

Si verum est quamlibet partem materiae, utcunque exiguam continere infinitas creaturas, sive esse Mundum, sequitur etiam materiam esse reapse in infinita puncta divisam. Verum autem hoc est, modo sit possibile, nam auget multitudinem existentium et harmoniam rerum, sive admirationem sapientiae divinae. Hinc porro sequitur quamlibet materiae partem esse cuilibet commensurabilem, qui rursus est admirabilis effectus harmoniae rerum. Videndum an hoc vere sequatur. Ubi examinanda illa alibi usus sum ratiocinatio qua videbatur sequi, quod circulus si sit rationem habeat ad diametrum ut numerus ad numerum. Videndum an haec consequentia sit bona. Videndum tamen an non in liquido nunc major nunc minor sequatur subdivisio, pro variis in eo solidi motibus; adeoque examinandum rigorose, an perfecta divisio liquidi in puncta metaphysica, an

cal plenum is consistent with a metaphysical vacuum which is unassignable.[5] Perhaps it follows from this that matter is divided into perfect points, i.e., into all the parts into which it can be divided. No absurdity follows from this. For it will follow that a perfect fluid is not continuous but is discrete, i.e., is a multitude of points. Therefore it does not follow from this that a continuum is composed of points, for liquid matter would not be a true continuum, even if space is a true continuum. From this, again, it is evident how much difference there is between space and matter. Matter alone can be explained by multitude without continuity. And indeed matter seems to be a discrete entity; for even if it is assumed to be solid, yet in so far as it is matter, when its cement[6] ceases to exist (e.g., by motion or something else) it will be reduced to a state of liquidity, i.e., of divisibility, from which it follows that it is composed of points. I prove this
474 as follows: every perfect liquid is composed of points, since it can be dissolved into points. I prove this by the internal motion of a solid. Matter is therefore a discrete, not a continuous entity. It is only contiguous, and is united by motion or by a kind of mind.[7]

It seems that there is some centre of the entire universe,[8] and some general infinite vortex; also some most perfect mind, or God. This mind, like a soul, exists as a whole in the whole body of the world; the existence of things is also due to this mind. It is the cause of itself. Existence is simply that which is the cause of consistent sensations. The reason of things is the aggregate of all the requisites of things.[9] God is derived from God.[10] The infinite whole is one. Particular minds exist, in sum, simply because the supreme being judges it harmonious that there should exist somewhere that which understands, or, is a kind of intellectual mirror or replica of the world. To exist is nothing other than to be harmonious; consistent sensations are the mark of existence.

If it is true that any part of matter, however small, contains an infinity of creatures, i.e., is a world, it follows also that matter is actually divided into an infinity of points. But this is true, provided that it is possible, for it increases the multitude of existents and the harmony of things, or, the admiration of the divine wisdom. Hence it follows further that any part of matter is commensurable with any part,[11] which again is an admirable effect of the harmony of things. One must see if this truly follows. Here one must examine that argument which I used elsewhere, from which it seemed to follow that a circle, if it exists, has a ratio to its diameter as a number has to a number. One must see if this inference is valid. One must see whether, in a liquid, there does not follow a subdivision which is now greater and now less, in accordance with the various motions of a solid in it. And so one must examine rigorously whether there follows the perfect

vero tantum in puncta mathematica sequatur. Nam puncta mathematica possent appellari indivisibilia Cavaleriana, etsi non sint metaphysica seu minima. Quod si ostendi posset plus minusve dividi liquidum, sequetur non resolvi liquidum in indivisibilia. Posset tamen defendi liquidum componi ex punctis perfectis, etsi nunquam in illa prorsus resolvatur, vel ideo quia omnium est resolutionum capax, et caemento cessante, mente scilicet et motu, cessabit.

Deus non est quiddam Metaphysicum, imaginarium, incapax cogitationis, voluntatis, actionis, qualem nonnulli faciunt, ut idem futurum sit ac si diceres Deum esse naturam, fatum, fortunam, necessitatem, Mundum, sed Deus est Substantia quaedam, Persona, Mens. Possent inscribi
475 Meditationes istae, *de arcanis sublimium,* vel etiam *de Summa Rerum.* Nimiae abstractiones Philosophorum imaginariorum, quibus Deum ad quoddam nihilum imperceptibile reduxere, causa fuere, cur Vorstius indignatus chimaericis illis et honori Divino contrariis opinionibus, contra ut Deum substantiam quandam et personam esse ostenderet, fecerit corporeum, certoque loco inclusum. Ostendendum est Deum esse personam seu substantiam intelligentem. Rigorose demonstrandum est, quod sentit se agere in se ipsum, nihil enim admirabilius quam idem sentire ac pati a se ipso.

Evolvendus est quam rigorosissime omnis ille de compositione continui labyrinthus, videatur liber Fromondi, agendum de angulo contactus, nam ad Geometras non pertinet illa disputatio sed ad Metaphysicos. Tentandum an demonstrari possit esse aliquod infinite parvum, nec tamen indivisibile. Quo existente sequuntur mira de infinito. Nempe si [fingantur] creaturae alterius Mundi, infinite parvi, nos ipsorum comparatione fore infinitos. Unde patet vicissim nos fingi posse infinite parvos comparatione alterius Mundi, qui infinitae magnitudinis et tamen terminatus sit. Unde patet infinitum aliud esse, ut certe vulgo sumimus, quam interminatum. Rectius hoc infinitum appellaretur Immensum. Mirum illud quoque, qui ab infinitis vixerit annis, posse incepisse, et qui numero annorum majore quam quilibet numerus finitus vivat, aliquando mori posse. Unde sequetur esse numerum infinitum. Aliunde constat necessario numerum esse infinitum, quando liquidum reapse dividitur in partes numero infinitas,

division of a liquid into metaphysical points, or only into mathematical points. For mathematical points could be called the indivisibles of Cavalieri,[12] even if they are not metaphysical, i.e., are not minima. But if it could be shown that a liquid is divided to a greater or less extent, it would follow that a liquid is not resolved into indivisibles. But one could defend the composition of a liquid out of perfect points, even if it is never wholly resolved into them, since it is capable of all resolutions, and will cease when its cement—namely, mind and motion—ceases.

God is not as some represent him—something metaphysical, imaginary, incapable of thought, will, or action, so that it would be the same as if you were to say that God is nature, fate, fortune, necessity, the world.
475 Rather, God is a certain substance, a person, a mind. Meditations of such a kind could be entitled *On the Secrets of the Sublime*, or again *On the Supreme Being*. The excessive abstractions of those who are supposed to be philosophers, by which they have reduced God to some imperceptible nothing, were the reason why Vorstius[13]—rebelling against these chimerical views, which are contrary to the divine honour—made God corporeal and included in a certain place, so that he might show to the contrary that God is a substance of a certain kind and a person. It must be shown that God is a person, i.e., an intelligent substance. It must be demonstrated rigorously that he senses his own action on himself, for nothing is more admirable than for the same being to sense and to be affected by itself.

One must unravel, with the greatest rigour, the entire labyrinth concerning the composition of the continuum (see the book by Fromond)[14] and one must discuss the angle of contact;[15] for that dispute is the concern, not of geometers, but of metaphysicians. One must see if it can be proved that there exists something infinitely small, but not indivisible. If this exists, wonderful consequences about the infinite follow. Namely: if one imagines creatures of another world, which is infinitely small, we would be infinite in comparison with them. From which it is evident that we, conversely, can be imagined to be infinitely small in comparison with the inhabitants of another world, which is of infinite magnitude and yet is limited. From which it is evident that the infinite is—as indeed we commonly suppose—something other than the unlimited. This infinite would more correctly be called the immeasurable.[16] There is this wonderful consequence, too: that someone who has lived for an infinity of years can have begun to live, and that someone who lives for a number of years which is greater than any finite number can die at some time. From which it will follow that there is an infinite number.[17] Another way of establishing that an infinite number necessarily exists is when a liquid is actually

quod si impossibile est, sequetur et liquidum esse impossibile. Cum videamus Hypothesin infinitorum et infinite parvorum praeclare consentire ac succedere in Geometria, hoc etiam auget probabilitatem esse revera.

Non possunt omnia possibilia a quoquam distincte intelligi, implicant enim. Perfectissimum Ens est, quod plurima continet. Quale est Ens capax idearum et cogitationum, hoc enim multiplicat rerum varietates ut speculum. Unde Deus necessario Ens cogitans, etsi non est Ens cogitans omnia, erit perfectius ipso. Ens omniscium et omnipotens perfectissimum est. Ens cogitans vel ideo necessarium, ut quaedam quae non existunt saltem cogitentur, ea scilicet quae prae caeteris merentur cogitari; itaque cum possibile omne sit cogitabile, eligentur tamen aliqua quae cogitabuntur reapse.

476 Inventiones pulchrae et imagines ingeniosae sunt de harmonia rerum. Harmonicum maxime quod gratissimum [perfectissimae] mentium. Si Deus Mens et persona, sequitur ratione Dei et caeterarum mentium locum habere debere quaecunque possunt demonstrari de optima Republica; cuius Rex et sapientissimus et potentissimus. Itaque in Mundo nemo debet miser esse nisi qui velit. Imo rationi videtur consentaneum, ut ne maneat quidem miser nisi qui velit. Unde sequetur nullum unquam cuiquam fore relictum querendi colorem. Omnia bona sunt credenti, Deum amanti, Deo confidenti. Omnia non tantum in universum bona sunt, sed et particulatim cuivis hoc intelligenti. Non video an non damnatio aeterna sit conformis cum harmonia rerum. Posse fieri ut damnatio sit infinitae durationis non tamen interminatae, idque probabile esse, consentaneum esse harmoniae rerum. Non videtur credibile, ut quaevis mens subeat omnes variationes, et aliquando misera et mala sit; neque enim exaequanda videntur omnium fata; quia quicquid Sapienti displicere intellectum, id videtur et Deo displicere debere; nam videtur esse de ratione, ut Sapiens sit contentus. Non videtur autem sapiens esse contentus, si sciat se aliquando miserum fore, aut si dubitet, fueritne jam aliquando, an adhuc futurus sit. Nisi dicamus, hoc intelligendum non nisi de praeteritis. Et quemlibet impraesentiarum sapientem et felicem certum esse debere, quod nunquam futurus sit, nec insciens nec infelix. Omnem relapsum esse notam nunquam fuisse vere

divided into parts that are infinite in number; for if this is impossible, it will follow that a liquid too is impossible. As we see that the hypothesis of infinites and of infinitely small things is admirably consistent and is successful in geometry, this also increases the probability that they really exist.

All possibles[18] cannot be understood distinctly by anyone, for they imply a contradiction. A most perfect being is that which contains the most. Such a being is capable of ideas and of thoughts, for this multiplies the varieties of things, like a mirror. Therefore God, who is necessarily a thinking being, even if he is not a being which thinks everything,[19] will be more perfect by that very fact. A being which is omniscient and omnipotent is the most perfect. A thinking being is necessary so that certain things which do not exist are at any rate thought—namely those which deserve to be thought rather than others. Therefore, though everything possible is thinkable, there will be chosen some things which will really be thought.

476 There are beautiful discoveries and ingenious images with regard to the harmony of things. That is most harmonious which is most pleasing to the most perfect mind. If God is a mind and a person then it follows that there ought to hold, in respect of God and of other minds, whatever can be demonstrated of the best commonwealth, whose king is most wise and most powerful. Therefore, no one in the world need be unhappy, except someone who wants to be unhappy. Further, it seems comformable to reason that no one should remain unhappy, except someone who wants to remain unhappy. From which it will follow that no excuse for complaint is ever left for anyone. All things are good to the person who believes, who loves God, and who trusts God. Not only are all things good in general; they are good in particular for anyone who understands this. It does not seem to me that eternal damnation is inconsistent with the harmony of things. It can be that damnation is of infinite duration but is not endless,[20] and the probability of this agrees with the harmony of things. It does not seem credible that any mind you please should undergo all variations, and should sometimes be unhappy and evil;[21] nor, again, does it seem that the fates of all are to be placed on a level. For it seems that whatever, on being understood, displeases a wise person ought also to displease God; for it seems that, by definition, a wise person should be content. But the wise person does not seem to be content if he knows that he will at some time be unhappy, or if he is in doubt as to whether he has already been unhappy, or will be unhappy in the future. Unless we say that this is to be understood only of past events, and that at the present time any wise and happy person must be certain that he will never, in the future, be either ignorant or unhappy. Every relapse is an indication that the person who has relapsed

sapientem, qui relapsus est. Adeoque illud consequitur omnem felicitatem esse interminatam. Nullam miseriam esse interminatam, posse tamen esse aeternitatem. Itaque diutius felices fore beatos, quam damnati futuri infelices. Dei gratiam consistere in largitione voluntatis. Nam habenti bonam voluntatem, felicitatem esse in potestate. Qui hoc agnoscunt queri non possunt, coguntur enim agnoscere se felices esse si velint. Quod sufficit. Omnem inquisitionem ultra ridiculam et inanem esse, et in infinitum ituram. Videtur damnatos hoc ipso sophismate irretitum iri, Deoque indignaturos, quod ipsis non largiatur voluntatem.

Mentem omnem esse durationis interminatae. Mentem omnem etiam Materiae cuidam indissolubiliter implantatam; Materiam illam esse certae
477 magnitudinis. Omnem mentem habere vorticem circa se. Omnes globos Mundanos forte Mente praeditos esse; nec absurdas videri intelligentias. Obstat quidem quod liberum non satis habeant motum, sed cum intelligant officium suum, et cum Deo communicent, per influentias illas mutuas corporum quas sentiunt; non affectabunt motus varietatem. Innumeras ubique esse mentes, Mentes in ovo humano esse etiam ante conceptionem nec perire, etsi nunquam sequatur conceptio. Nescire nos miros rerum usus quibus a providentia destinantur.

Quicunque recte ista intelligit, non potest non esse felix, et contentus; et quaecunque in mala incidat, Deo fidens, Deum amans. Ego neminem me feliciorem novi, vel ideo quod mihi hoc intelligere Deus dedit, quare nulli Regum invideo; certusque sum Deum peculiarem gerere curam mei, id est ingenti[bus] Gaudiis mentem meam destinasse, cui hanc tam certam et facilem aperuit viam felicitatis. Nec miraculis opus ad Dei gratiam explicandam, tametsi multa concurrant ita rara, ut satis appareat Dei consilio fieri. Omnia enim ab initio sic ordinavi[t] Deus. Ego mentes singularibus gaudiis, et insigni felicitati destinatas considero, ut in magno infinitorum numerorum numero eos, qui insignia praebent theoremata. Et disquisitionis foret egregiae, an ex tota numerorum finitorum universitate aliquis definiri possit, omnium pulcherrimus, nisi is forte unitas, quae simul omnes potentias refert.

Numerorum finitorum numerus non potest esse infinitus. Unde sequitur non posse esse infinitos numero Quadratos finitos, deinceps ab unitate ordine sumtos. Unde videtur sequi Numerum infinitum esse impossibilem. Tantum videtur probandum quod Numerorum finitorum numerus non potest esse infinitus. Si numeri ponantur se excedere unitate continue,

was not truly wise. And so it follows that all happiness is endless, and that no unhappiness is endless—even though it can be an eternity. Therefore the blessed will be happy longer than the damned will be unhappy. The grace of God consists in the gift of will; for happiness is in the power of a person who has a good will. Those who recognise this cannot complain, for they are compelled to recognise that they are happy if they want to be. This is sufficient; any inquiry beyond this is ridiculous and inane, and will proceed to infinity. It seems that the damned will be ensnared in this sophism, and will be angry with God for not bestowing a will on them.

Every mind is of endless duration. Every mind is indissolubly implanted in matter; this matter is of a certain magnitude. Every mind has a
477 vortex around itself. All the globes of the world are perhaps endowed with a mind, nor do the intelligences seem absurd. There is this obstacle, that they do not have enough unrestricted motion;[22] but since they understand their duty and communicate with God, through the mutual influences of the bodies which they sense, they will not aim at a variety of motion. There are innumerable minds everywhere; there are minds in the ovum even before conception, nor do they perish, even if conception never follows. We do not know the wonderful uses of things, to which they are destined by providence.

Whoever understands these things correctly cannot fail to be happy and content, trusting God and loving God, whatever the evils into which he falls. I know no one happier than I am, because God gave me this understanding, as a result of which I envy no king; and I am certain that God takes special care of me, that is, that he has destined my mind for immense joys, in that he has opened to me such a certain and easy way of happiness. Nor is there any need of miracles to explain the grace of God, even though many rare things concur in such a way that it is evident that they occur by God's decision. For God arranged all things from the beginning in this way. I consider minds as destined for unparalleled joys and extraordinary happiness, just as I hold in high esteem those of the infinite numbers which afford extraordinary theorems. And it would be the subject of a fine inquiry to discover whether, out of the entire totality of finite numbers, one number can be defined which is the most beautiful of all—unless perhaps this is the number one, which represents all powers at the same time.[23]

The number of finite numbers cannot be infinite; from which it follows that there cannot be an infinity of finite square numbers, taken in order starting from one. From which it seems to follow that an infinite number is impossible. It seems that one only has to prove that the number of finite numbers cannot be infinite. If the numbers are assumed to exceed each

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4. De Sede Animae

478 Sex annis abhinc Serenissimus dux Hannoveranus, solitus de religione meditari Boineburgio commiserat ut sententiam meam exquireret circa resurrectionem carnis. Hanc brevi scripto comprehensam tunc Duci transmisi. Nunc Februario anno 1676 incido communicante *Knorrio* in scriptum Boylii 1675 editum *de possibilitate resurrectionis,* ubi multa meis egregie consentientia. Tantum ille chymicis illustrationibus diutius institit. Difficultates ego presse magis secutus sum. Nimirum arbitror florem substantiae esse corpus nostrum. Hunc florem substantiae in omnibus mutationibus subsistere perennem. Adumbratum per *Luz* Rabbinorum. Facile hinc apparere cur Canibales hominem vorantes nihil habeant juris in substantiae florem. Hunc substantiae florem per totum corpus diffusum, solam quodammodo formam continere. Adde huc quae Borellus in Microscopicis observationibus habet de arboris cerasi figura in cortice grani sive trucis fructui inclusae. Item quae de Arbore Philosophorum. Item quae in Diario Gallico ex Anglico de vi plastica, Vim plasticam nihil aliud esse quam substantiam illam activam certae figurae, quae se cum
479 potest auget. Videtur ea esse jam ante conceptionem, [con]ceptione tantum ei augmenti dari facultatem. Adde Scheckium de vi plastica, Davissonium aliosque. Ego [tantum] addo, quod non observatum Boylio, videri animam huic ipsi flori substantiae firmiter implantatam. Vide quae Per-

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other continuously by one, the number of such finite numbers cannot be infinite, for in that case the number of numbers is equal to the greatest number, which is assumed to be finite. It has to be replied that there is no greatest number. But even if they were to increase in some way other than by ones, yet if they always increase by finite differences, it is necessary that the number of all numbers always has a finite ratio to the last number;* further, the last number will always be greater than the number of all numbers. From which it follows that the number of numbers is not infinite; neither, therefore, is the number of units. Therefore there is no infinite number, or, such a number is not possible.

4. On the Seat of the Soul

A, No. 61

February 1676

478 Six years ago his Serene Highness the Duke of Hanover,[1] who was in the habit of meditating about religion, instructed Boineburg[2] to seek out my opinion about the resurrection of the flesh. I put this together in a short paper,[3] which I then sent to the Duke. Now, in February 1676, I have come across (thanks to a communication from Knorr)[4] a writing published by Boyle in 1675, *About the possibility of the Resurrection*,[5] where there are many things which agree admirably with my views. However, Boyle spent too long on chemical illustrations; I have followed up the difficulties with more precision. I think that the flower of substance[6] is our body. This flower of substance subsists perpetually in all changes; it is adumbrated by the "Luz" of the Rabbis.[7] It is easily seen from this why cannibals,[8] devouring a man, have no power over the flower of substance. This flower of substance is diffused through the whole body, and in a way contains form alone. Add also what Borel, in his *Microscopic Observations*,[9] says about the shape of the cherry tree which is included in the shell of the kernel, or of the wild fruit.[10] Add, too, what is said of the tree of the philosophers, and also what is said by an Englishman in the French journal about plastic power[11]—that plastic power is nothing other than an active substance of a certain shape, which increases when it can. This power **479** seems to exist before conception; at conception it is only given the faculty of growth. Add Sheck on plastic power, Davisson, and others.[12] I add only what was not observed by Boyle: that the soul seems to be firmly implanted in this flower of substance. See what Perrault will argue against

*[NOTE BY LEIBNIZ] Rather (N.B.) one proves by this only that such a series is endless.

raltus ratiocinabitur contra Mariottum de sede animae. Si vero opus esset explicare etiam caeterae massae restitutionem, quod tamen non opus, cum sit fere terra (vide quae huc duci possunt de existentia corporum in corpore, de aqua Eucharistica et vino et pane; scholastici), posset id forte fieri in dissolutione generali, quemadmodum mira ratione singulari experimento, si varii sales in eadem aqua solvantur, singuli cognati reconpinguntur sine perturbatione, quod autem in quatuor id majore subtilitate in 1 000 000 000 etc. speciebus salium etiam effici potest; jam fingantur? Quot in qualibet salium specie fit, in quolibet humano individuo fieri, subtiliore scilicet illa solutione et celeriore tempore omnia poterunt recompingi per crystallisationem. Argumentum a Canibalibus sumtum, demonstrativum est et probat florem substantiae intelligi debere. Adde huc quae Libavius et Quercetanus habent de resurrectione, et quae Kircherus, item Glauberus de regeneratione Nitri, item [text breaks off]

5. De Unione Animae et Corporis

480 *L'opinion de Mons. Perrault est, que l'ame est egalement par tout le corps, et que le sentiment se fait* in ipso sensorio, *dans les yeux, dans les pieds etc.*

Ego crediderim esse liquorem quendam sive si mavis aetheriam substantiam, toto corpore diffusam, continuumque; per quam sentiat anima; quae nervos inflet, quae contrahat, quae displodat. Huius substantiae quamlibet partem animatam minime credibile est, nam cum perpetuo avolet aliquid, etiam animae multiplicabuntur dividenturque. Non potest intelligi unius rei plus quam unam actionem passionemque esse. Anima autem si simul in pluribus est, id est operatur locis; simul plures habebit operationes diversas. Nec video quomodo eveniat unio, pone duarum liquidi partium obstrui communionem; quis non videt, animam in duas abituram. Ut si fretum Gaditanum obstrueretur. Itaque crediderim in ipso illo liquore esse quendam motus displosionisque fontem, ut in candela accensa. Porro in cerebri cavitatibus videtur omnis peragi gyratio, et anima tueri Vorticem suum. Species ipsas non esse nisi liquoris impressi undulationes. Omnem autem undulationem aeternum servari, etsi aliis

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Mariotte on the seat of the soul.[13] However, if it were necessary to explain also the restitution of the remaining mass—which, however, is not necessary, since it is for the most part earth (see what can be derived from this about the existence of bodies in a body, and about the Eucharistic water, wine, and bread; the Scholastics)—this could perhaps come about in a general dissolution. This can be shown in a wonderful way by a remarkable experiment. If various salts are dissolved in the same water, related individual ones are recombined without disturbance. But what can be done in the case of four species of salt can be done with greater subtlety in 1,000,000,000 and more species; may they now be assumed? As often as this happens in any species of salt, it happens in any human individual—namely that, in a more refined solution and in a quicker time, everything can be recombined by crystallisation. The argument based on cannibals[14] is demonstrative, and from that a flower of substance must be recognised. Add here what Libavius and Quercetanus say about the resurrection, and what Kircher says;[15] also what Glauber says about the regeneration of nitre; also [The manuscript breaks off here.]

5. On the Union of Soul and Body

A, No. 62

February ? 1676[1]

480 *The view of M. Perrault is that the soul is in the whole body equally, and that sensation occurs in the sensorium itself,*[2] *in the eyes, in the feet, etc.*

For my part, I would have thought that there is a certain liquid, or, if you prefer, an ethereal substance, diffused throughout the whole body, and continuous. Through it, the soul perceives; it inflates, contracts, and dilates the nerves. It is far from credible that every part whatever of this substance is animated; for since something is constantly flying away, souls too will be multiplied and divided. It is not intelligible that one thing should have more than one action and passion.[3] But if the soul exists at the same time in several things, i.e., operates in several places, it will at the same time have several different operations. Nor do I see how a union comes about if one assumes that the union of two parts of a liquid is obstructed; for who does not see that the soul will change into two? It is as if the Straits of Cadiz were obstructed. So I would have thought that in the liquid there is a kind of fountain of motion and dilation, as in a burning candle. Further, every kind of gyration seems to be performed in the cavities of the brain, as the soul observes its own vortex. Species[4] themselves are merely undulations of a liquid that is subject to pressure. Every undulation is preserved for eternity even if, when put together with others,

composita fiat imperceptibilis. Sed animam ipsam agitare vorticem, hoc vero mirum est. Facit tamen, agimus enim non per simplicem machinam, sed ex illis reflexionibus, sive actionibus in nos ipsos. An forte ipse totus vortex magni ⟨orbis⟩ simili anima vivificatur, quae causa est, cur systematis leges observentur, et ⟨compensentur⟩ omnia. Totus Mundus unus Deo vortex.

6. De Magnitudine

482 Magnitudo, Ratio, Numerus, Totum, Pars, Mensura, Aestimatio, Valor, Pretium, Meritum, Demeritum (si ita loqui licet) connexa sunt.

Considerandum est magnitudinem reperiri in Loco, Tempore, Corpore, Motu, Angulo, Qualitate, Virtute, Numero, Ratione.

Est quaedam relatio magnitudinis ad totum, et videtur magnitudo esse id per quod cognoscitur an res aliqua sit tota. Ut si mihi pecuniam afferat aliquis, cuius nota mihi quantitas, facile judicabo an totam ferat. Superest tamen aliqua difficultas. Nam si qua res sit dissimilaris, etiam non cognita, eius quantitate judicari potest non esse totam. Ut si quis mihi adducat animal pede multatum, facile judico non esse integrum, si sciam esse quadrupes.

Solebam olim definire Magnitudinem, Numerum partium, sed postea consideravi id nihil esse nisi constet partes esse aequales inter se, aut datae rationis. Sed magnitudo intrat in definitionem aequalitatis aut rationis, id ergo foret definire idem per idem.

Multa tentando hanc reperisse videor commodissimam Magnitudinis notionem. *Quantitas sive Magnitudo* est, secundum quam res aliqua (quae *tanta* dicitur) alteri cuidam, *congruere* posse (id est intra eosdem terminos redigi posse) dicitur. *Congruere* enim ajo quae sunt intra eosdem terminos. Ut quantitas alicuius arcus erit eius tripedalitas si extensus rectae tripedali congruere possit. Si altera illa, ut hoc loco recta tripedalis, tertiae, ut pedis, numero sive ratione expressa sit, tertia illa, ut hoc loco pes, dicetur *Mensura*. Utile est autem mensuram esse mediocrem, durabilem, facile applicabilem, simplicem.

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it becomes imperceptible. But that the soul itself agitates a vortex—that is wonderful. But it does so, for we do not act as a simple machine, but out of reflection, i.e., of action on ourselves. Perhaps the whole vortex of the great globe is vivified by a soul of the same kind, which is the reason why the laws of the system are observed, and all things are compensated. The whole world is one vortex for God.[5]

6. On Magnitude

A, No. 64

Early ? 1676[1]

482 Magnitude, ratio, number, whole, part, measure, worth, value, price, merit, and (if the term be allowed) demerit[2] are connected.

One must consider that magnitude is found in place, time, body, motion, angle, quality, virtue, number, ratio.

Magnitude has a certain relation to the whole, and it seems that magnitude is that by which it is known whether some thing is a whole. Thus, if someone brings me money, the quantity of which is known to me, I can easily judge whether he brings the whole amount. But some difficulty remains. For if a thing, even an unknown thing, is dissimilar, it can be judged by its quantity not to be a whole. Thus, if someone brings me an animal which is short of a foot,[3] I easily judge that it is not whole, if I know that it is a quadruped.

I once used to define magnitude as the number of parts,[4] but later I considered that to be worthless, unless it is established that the parts are equal to each other, or of a given ratio. But magnitude enters into the definition of equality or ratio, so that would be to define something in terms of itself.

After many attempts I seem to have found the most suitable concept of magnitude, which is this: *quantity or magnitude* is that according to which some thing (which is called "so big") is said to be capable of being *congruent* with some other thing (that is, capable of being brought within the same boundaries). For I say that those things are "congruent" which are within the same boundaries. Thus, the quantity of some arc will be three feet[5] if, on being extended, it can be congruent with a three-foot straight line. If that other thing (as in this case a three-foot straight line) is expressed by the number or ratio of a third thing, such as a foot, then that third thing—in this case, a foot—will be called a "measure." It is useful that the measure is of medium size, durable, easily applicable, and simple.

Number, if it is understood simply as integral and rational, is a whole

tatibus constans. Si generalius sumatur, fractumque et irrationalem comprehendat, erit Quantitas homogenea* unitati, intelligibilis relatione ad unitatem. (Unde notandum, cum sit aliqua numeri quantitas, et ipse numerus sit quantitas, fore quantitatem quantitatis uti alioqui datur ratio rationis.)

483 *Ratio* quiddam est numero (vel unitati) homogeneum (nihil aliud enim unitas quam ratio aequalitatis) expressum relatione duarum quantitatum expositarum. Itaque dicere Rationem esse relationem quandam non est eius vim exprimere. Qui Analysin intelligunt, sciunt Rationem esse quiddam numero homogeneum, eique addi atque adimi posse, ut si $\frac{a}{b}$ sit ratio a ad b, erit unitas $\frac{b}{b}$ seu ratio b ad b. Adeoque erit $1 + \frac{a}{b}$ idem quod $\frac{b}{b} + \frac{a}{b}$ sive idem quod $\frac{b + a}{b}$.

Proportio est rationum aequalitas. Unde intelligi potest nihil aliud esse proportiones calculo expressas quam fractionum quarundam aequationes. *Maius* est cuius pars alteri toti (quod *Minus* appellatur) aequalis est. Hinc demonstratur theorema: totum esse maius parte. Ut vel hinc discamus omnem propositionem quae non est accidentalis (ut experimentum) neque arbitraria (ut definitio) neque identica (ut nihil potest simul esse et non esse, quodlibet sibi ipsi aequale est etc.) esse demonstrabilem.

Regula est instrumentum agendi determinans formam actionis, perpetua ac successiva applicatione agentis ad instrumenti partes. Circinus est instrumentum agendi determinans formam, sed sine illa ad circini partes applicatione successiva. Ita filum in labyrintho, semita in campo quaedam agendi regula est. Regula etiam curva esse potest, ut si orbi cuidam plano ac rotundo stylum applicem, manuque circa orbem agam, orbis ille mihi regula erit. Instructio quam Princeps dat legato abeunti regula est, si ita scripta sit, ut legatus eam tantum ordine in agendo sequi possit. Potest ergo *Lex* esse quae non sit regula, ut si alius sit praeceptorum quam actionum ordo, licet ex illis ordo agendi ratione recta derivari possit.

*de homogeneis infra

consisting of unities. But if it is taken more generally, and includes fractions and irrationals, it will be a quantity homogeneous* with unity, and intelligible in relation to unity. (From this it is to be noted that, as a number has some quantity, and number itself is a quantity, there will be a quantity of a quantity, just as there is also a ratio of a ratio.)

483 A *ratio* is something that is homogeneous with number or with unity (for unity is nothing other than the ratio of equality) expressed by the relation of two stated quantities. And so to say that a ratio is a certain relation is not to express its meaning. Those who understand analysis know that a ratio is something homogeneous with number, and that one can add to and subtract from it. Thus, if $\frac{a}{b}$ is the ratio of a to b, unity will be $\frac{b}{b}$, i.e., the ratio of b to b. And so $1 + \frac{a}{b}$ will be the same as $\frac{b}{b} + \frac{a}{b}$, or the same as $\frac{b + a}{b}$.

Proportion is an equality of ratios. From this it can be understood that proportions expressed in a calculation are nothing other than equations of certain fractions. The *greater* is that of which some part is equal to another whole (which is called "less"). From this there is a proof of the theorem that the whole is greater than the part.[6] We may learn from this that every proposition which is neither accidental (such as one based on experience) nor arbitrary (such as a definition) nor identical (such as the proposition that nothing can at the same time be and not be, that anything whatever is equal to itself, etc.) is demonstrable.

A *rule* is an instrument of action, determining the form of the action by the perpetual and successive application of the agent to the parts of the instrument.[7] A pair of compasses is an instrument of action that determines the form of the action, but without the required successive application to the parts of the compasses. So a thread in a labyrinth, a footpath on a plain is a rule of action. A rule can also be curved; e.g., if I apply a pen to an orb that is smooth and round and make a movement with my hand around the orb, the orb will be a rule for me. The instruction which an emperor gives to a deputy on the latter's departure is a rule if it is written in such a way that the deputy, in his action, can only follow it in order. There can therefore be a *law* which is not a rule, as when the order of the precepts is different from that of the actions, even though it is possible to derive from the precepts, by correct reasoning, the order of action.

*[NOTE BY LEIBNIZ] On homogeneous terms, see below.

Totum est ad cuius naturam plura homogenea pertinere intelligi potest, quae dicuntur partes.

Homogenea sunt quibus aliqua forma sive natura per se intelligibilis variis modis convenit. Ut extensio, moles, duratio, motus, cogitatio. Unde patet Album et nigrum esse homogenea, participant enim natura quadam communi, scilicet mole sive corporeitate. Color autem non est aliquid per se intelligibile, etsi per se concipiatur, quia non distincte. Sed haec subtiliora sunt, quam ut hic explicari possint.

484 *Duratio* est existendi continuitas. Tempus non est duratio, non magis quam spatium collocatio. Et ineptum foret dicere, diem esse durationem. Cum contra Hemerobia per diem durare dicamus. Tempus est continuum quoddam secundum quod aliquid intelligitur durare. Sed ut rem clarius explicem, cogitandum est eam potissimum tempori naturam tribui, ut plura simul esse intelligantur.

Simul autem sunt quae una mentis actione sentiri possunt. Sed quoniam ipsa Mentis actio habet tractum, videndum an non ⟨ea⟩ *Simul* esse dicamus, quorum si unum existit, existit et alterum.

Atque illud sane in confesso est, si duo sint eiusmodi, ut impossibile sit alterum sine altero intelligi, ea *simul* esse. Et certe si perfecte sapientes essemus id est Dii, facile videremus quae nobis per accidens simul esse nunc videntur ob ignorantiam nostram, coexistere ipsa [natura], id est Divini intellectus necessitate. Sed haec accuratius discutienda. Sunt enim ultimae denique horum notiones inexplicabiles, vel ideo quia per se intelliguntur simplicesque sunt.

Aeternitas si ut aliquid tempori homogeneum concipiatur, erit tempus interminatum; sin ut attributum alicuius aeterni, erit duratio per tempus interminatum. Sed vera origo atque intima aeternitatis natura est ipsa existendi necessitas, quae nullam per se dicit successionem, etsi fiat ut omnibus coexistat, quod aeternum est.

Ut in duratione, ita in Extensione est forma quaedam simplex per se intelligibilis, cuius idea est praesens menti, quaeque adeo est inexplicabilis. Id ergo secundum quod res dicuntur extensae, cui extensio sola per se competit, in ordine tamen ad ea quae aliud quiddam praeterea continent, dicitur *Locus,* et absolute, *Spatium,* et secundum spatium res

A *whole* is that to whose nature there can be understood to belong several homogeneous things, which are called "parts."

Those things are *homogeneous* with which there agrees in various ways some form or nature which is intelligible *per se*. For example: extension, mass, duration, motion, thought. It is evident from this that white and black are homogeneous, for they participate in some common nature, namely mass or corporeality. But color is not something which is intelligible *per se*, even though it is conceived *per se;* for it is not conceived distinctly. But these matters are too subtle to be explained here.[8]

484 *Duration* is a continuity of existing. Time is not duration, any more than space is collocation. And it would be absurd to say that a day is a duration, since on the contrary we say that the ephemerids endure for a day. Time is something continuous, according to which something is said to endure. But to explain the matter more clearly, it must be borne in mind that the nature which, above all, is to be ascribed to time is that several things are understood to exist simultaneously.[9]

Those things are *simultaneous* which can be sensed by one action of the mind. But since the action of the mind has an extent itself, one must see if we should not say that those things are "simultaneous" which are such that, if one exists, the other also exists.

And indeed it is generally admitted that, if two things are of such a kind that it is impossible for the one to be understood without the other, then they are "simultaneous." And certainly, if we were perfectly knowing, i.e., if we were gods, we would easily see that those things which, because of our ignorance, now appear to exist at the same time by accident, co-exist by their very nature, i.e., by the necessity of the divine intellect. But these matters must be discussed more accurately. For there are ultimate inexplicable concepts of these things, because they are understood *per se* and are simple.

Eternity, if it is conceived as something which is homogeneous with time, will be unlimited time; but if it is conceived as the attribute of something eternal, it will be duration through an unlimited time. But the true origin and the inmost nature of eternity is the very necessity of existing, which does not of itself indicate any succession, even if it should happen that what is eternal co-exists with everything.

As in the case of duration, so in the case of extension there is a certain simple form which is intelligible *per se,* the idea of which is present to the mind, and which is therefore inexplicable. That, therefore, with respect to which things are called "extended," to which extension alone belongs *per se,* but is in a relation of order with respect to those things which contain something else besides, is called "place," and absolutely, "space"; and

concipimus sitas, et simul sensibiles, et invicem distantes, et figuratas. Sed ad haec explicanda profundiore opus meditatione. Illud interea notare suffecerit Immensitatem respondere aeternitati, utque aeternitas per se non dicit successionem, ita nec immensitatem dicere extensionem sive partes. Deinde notabimus, tam differe locum a corpore, quam tempus a re existente: Et quo argumento Cartesius eiusque sectatores probant, spatium ipsum, quia extensum, esse divisibile, adeoque mobile, et proinde esse corpus; eodem probabitur et temporis partes esse separabiles, horamque unam ab alia longius removeri posse, quod cum ipsa quam habemus temporis idea pugnat.

7. Excerpts from Notes on Science and Metaphysics

18. Martii 1676.

391 Posito spatium habere partes, dum scilicet in partes vacuas et plenas, variarum figurarum, a corporibus dividitur, sequitur spatium ipsum esse totum sive Ens per accidens: continuo mutari, et aliud fieri: mutatis scilicet partibus, et extinctis, aliisque subnatis. Sed est aliquid in spatio, quod manet inter mutationes, id vero aeternum est, neque aliud est, quam ipsa immensitas Dei, attributum scilicet unum atque indivisibile simul et immensum. Cuius spatium est consequentia tantum, ut proprietas Essentiae. Demonstrari facile potest materiam ipsam perpetuo extingui sive aliam atque aliam fieri. Eodem modo ostendi potest, et mentem continue mutari, excepto eo quod Divinum est in nobis seu quod extrinsecus advenit, prorsus ut in spatio est aliquid divinum, ipsa immensitas Dei, ita in mente est divinum quiddam, quod Aristoteles vocabat intellectum agentem, et hoc idem est cum omniscientia Dei; quemadmodum id quod in spatio divinum atque aeternum est, idem est cum Dei immensitate et id quod in corpore sive ente mobili divinum atque aeternum est, idem est cum Dei omnipotentia; et id quod in tempore est divinum idem est cum aeternitate.

392 Unum attributum mire servit ad alterum declarandum; nam aeternitas quiddam indivisibile est, est enim existendi necessitas, quae non exprimit successionem, durationem, divisibilitatem. Eodem modo, omnipraesentia seu ubiquitas non est divisibilis, quemadmodum spatium; et omnipo-

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with respect to space we conceive things as situated, as simultaneously perceptible, as distant from each other, and as having shape. But a more profound meditation is needed to explain these matters. Meanwhile, it will be sufficient to note this: that immeasurability corresponds to eternity, and that just as eternity *per se* does not indicate succession, so immeasurability does not indicate extension or parts. Then we shall note that place differs from body as much as time differs from a thing which exists; and further, the argument by which Descartes and his followers prove that space itself, since it is extended, is divisible and therefore mobile, and indeed is a body[10]—that same argument will prove that the parts of time are separable, and that one hour can be moved away from another, which conflicts with the very idea that we have of time.

7. Excerpts from Notes on Science and Metaphysics

A, No. 36

18 March and 22 March, 1676

18 March 1676

391 It being granted that space has parts—that is to say, whilst it is divided by bodies into parts that are empty and full, and of various shapes—it follows that space itself is a whole, or an entity *per accidens;* that it is continually changed, and becomes now this and now that; namely, in so far as its parts have been changed, and some have become extinct and others have succeeded them. But there is something in space that remains throughout changes, and this is eternal; it is nothing other than the immeasurability of God, namely an attribute which is at the same time one, indivisible, and eternal. Space is only a consequence of this, as a property is a consequence of essence. It can easily be proved that matter itself is perpetually extinguished, or, becomes now this and now that. In the same way it can be shown that the mind also is continually changed, with the exception of that in us which is divine, or, comes from outside. In sum, just as there is something divine in space, namely the immeasurability of God, so there is something divine in the mind, which Aristotle used to call the active intellect,[1] and this is the same as the omniscience of God; just as that which is divine and eternal in space is the same as God's immeasurability, and that which is divine and eternal in a body, or a mobile entity, is the same as God's omnipotence; and that which is divine in time is the same as
392 eternity. One attribute serves wonderfully to explain another; for eternity is something that is indivisible, since it is the necessity of existing, which does not express succession, duration, or divisibility. In the same way, omnipresence or ubiquity is not divisible, in the way that space is, and

tentia non est subjecta variationi quemadmodum corporum formae.

Valde notabilia sunt ista, ad ostendendum, quod solus Deus sit aeternus, nam si spatium non est aeternum multo minus materia erit. Nimirum et materia perpetuo alia atque alia fit. Quoniam ipsa non nisi in relatione existit, ut alibi vel ex individuationis principio omnium rerum ostendi.

Quicquid divisibile est, quicquid dividitur, id alteratur, imo extinguitur. Materia est divisibilis, ergo est destruibilis, nam quicquid dividitur, destruitur. Quicquid in minima dividitur annihilatur; sed hoc impossibile. Alius annihilandi modus possibilis. Materia quodammodo esse habet a forma.

Est in materia, ut et in spatio quiddam aeternum; et indivisibile, quod illi intellexisse videntur, qui Deum ipsum esse credidere materiam rerum. Quod tamen non dicitur proprie, quia Deus non facit partem rerum: sed principium. Perfectio est attributum affirmativum absolutum; continetque semper omnia sui generis, cum nihil sit, quod ipsum limitet: nam cui aliquid dandum est, et ratio non est cur certum quiddam des, ei omnia dedisti.

Cum Mens sit aliquid certam habens relationem ad aliquam materiae portionem, tunc dicendum est cur in hanc et non adjacentes omnes se extendat, seu cur aliquod corpus, non omne ad eam pertineat eodem modo. Ponamus certam aliquam portionem esse materiae non interrup-
393 tam, vacuo undique cinctam: dicamus ad eam pertinere, ut habeat suam quandam mentem; vel ideo quia haec portio ab omni alia sejuncta est. Ponamus jam ab alia Materiae portione ac velut insula in Vacuo natante attingi: sequetur ex solo attactu coalescere in unum has duas mentes, quia vacuum nullum interjectum est, unde sequetur utriusque cogitationes confundi, et utramque simul et hanc et illam se meminisse, quod fortasse nec fieri potest. Sin putas hoc contactu fieri novam mentem, ob novum factum corpus, dicendum erit priores duas interiisse, quia et duo corpora illa interiere; sin dicas servari, extincto licet corpore, profecto tot erunt mentes in quolibet corpore, quot in eo assignabilia sunt puncta, quod est impossibile, quia punctorum numerus nullus. Consequentia facile patet.

omnipotence is not subject to variation, in the way that the forms of bodies are.

These things are most noteworthy for showing that God alone is eternal; for if space is not eternal, much less will matter be eternal. And certainly, matter perpetually becomes now this and now that; for it exists only in relation, as I have shown elsewhere from the principle of the individuation of all things.[2]

Whatever is divisible, whatever is divided, is altered—or rather, is destroyed. Matter is divisible, therefore it is destructible, for whatever is divided is destroyed. Whatever is divided into minima is annihilated; but this is impossible. Another method of annihilation is possible. Matter in some way has its being from form.

There is in matter, as there is in space, something eternal and indivisible; which seems to have been understood by those who believed that God himself is the matter of things.[3] But this is not said correctly, for God does not form a part of things; instead, he is their principle. Perfection is an affirmative absolute attribute,[4] and it always contains everything of its own genus, for there is nothing that limits it. For if there is something to which something is to be given, and there is no reason why you should give it some definite thing,[5] then you have given everything to it.

As the mind is something which has a certain relation to some portion of matter, then it must be stated why it extends itself to this portion and not to all adjacent portions; or, why it is that some body, and not every body, belongs to it in the same way. Let us assume that there is some portion of
393 matter, uninterrupted and surrounded on all sides by a vacuum; let us say that it pertains to that portion of matter that it has some mind of its own because of the fact that this portion is separated from every other portion. Now let us assume that it is touched by another portion of matter, like an island floating in the vacuum; it will follow from the contact alone that these two minds coalesce into one, since no vacuum is interposed, from which it will follow that the thoughts of each are mingled, and each of them—both the former and the latter—simultaneously remembers itself, which perhaps cannot happen. But if you think that a new mind comes into being with this contact, because a new body has been formed, then it will have to be said that the two former minds have perished, since the two bodies have also perished; but if you say that they are preserved, even though the body is extinct, then there will certainly be as many minds in any body as there are assignable points in it—which is impossible, since the points are without number. This consequence is easily seen; for what

Quod enim de hoc modo dividendi novum totum in partes scilicet, dici potest, dici poterit de omnibus. Itaque necesse est novam fieri mentem, prioribus extinctis; scilicet quae non habeat sensum identitatis, cum priore. Quod ego esse puto contra cogitationis naturam. Praeterquam quod hoc modo nullo negotio minimisque de causis mutarentur mentes, et alias planeque prioribus incohaerentes nanciscerentur cogitationes, quod toto vitae tempore minime experimur. Cum ergo aliunde mihi constet esse aliquam materiae portionem solidam, et infrangibilem, neque enim ulla tenax in primis originibus admitti potest, ut facile demonstrari posse arbitror, cumque praeterea connexio ex sola materia et motu explicari nequeat, ut satis alibi ostensum arbitror;* sequitur accedere cogitationem ad eam formandam, et unum fieri corpus atque insecabile, sive ἄτομον, cuiuscunque sit magnitudinis, quandocunque aliquam unam habet mentem. Porro quot sunt corpora firma in natura, tot necessario excitantur vortices, solo corporum firmorum motu. Et quot sunt vortices in Mundo, tot sunt Mentes, sive Munduli, sive perceptiones. Hinc facile intelligitur cur nulla mens naturaliter dissolvi possit, si posset enim, dissoluta fuisset dudum. Cum perpetuo ad quamlibet solvendum tota rerum natura connitatur. Hinc porro sequitur etsi non dissolvatur, sentire tamen mentem conatus omnes, et corpore suo excipere. Porro conatus nullus perditur in natura rerum, componunturque in mente, non destruuntur. Mens ad cognitionem veritatis pervenit, et ad faciendas propositiones, tum ad constantes quasdam et similiter recurrentes passiones pervenit. Neque enim
394 nisi ab experientia incipimus ratiocinari. Omnem Mentem esse Organicam, et discere aliquid, sed vix longissimo tempore, scilicet pro periodis rerum quas sentiunt. Si nostrae sensiones diu essent incohaerentes et perturbatae, velut aegri somnia, nec quaedam recurrerent, certa lege, diu futuri essemus infantes. Transmigratio animarum satis refutata est novis experimentis, de foetu jam praeformato. An memoria unice ab organis dependeat, atque an et quatenus ad cogitationem necessaria signa et imagines. Negari non potest, mentem aliam, ad aliam materiae portionem specialiorem obtinere relationem, quod quomodo fiat explicandum est.

22. Mart. 1676.

395 Ens cui omnia competunt attributa affirmativa possibile esse, ostendi forte

*error

can be said of this way of dividing a new whole into parts can be said of all. And so it is necessary that a new mind comes into being on the extinction of the former ones; namely, one that does not have a sense of identity with the former one. This, I believe, is contrary to the nature of thought. Besides, in this way minds would be changed with no difficulty and by the slightest causes, and thoughts would meet with other thoughts clearly inconsistent with earlier ones, of which we have very little experience during the whole period of our life. Since therefore I agree, on other grounds, that there is some solid and unbreakable portion of matter,[6] and nothing that holds things together[7] can be admitted in the basic origins of matter, as I believe can easily be proved; and since, again, connection cannot be explained by means of matter and motion alone, as, I think, has been satisfactorily shown elsewhere*—from all this it follows that thought enters into the formation of matter, and there comes into existence a body which is one and unsplittable,[8] i.e., an atom, of whatever size it may be, whenever it has a single mind. Further, there are necessarily produced, simply by the motion of firm bodies, as many vortices as there are firm bodies in nature. And there are as many minds, or little worlds, or perceptions, as there are vortices in the world. From this it can easily be understood why no mind can be dissolved naturally; for if it could, it would have been dissolved long ago. For the whole universe constantly exerts itself to dissolve any mind. From this it follows that even if it is not dissolved, the mind senses all endeavours,[9] and receives them by means of its body. Further, no endeavour in the universe is lost; they are stored up in the mind, not destroyed. The mind attains to the knowledge of truth, and to the making of propositions; then it attains to some passions that are
394 constant and recur in a similar way. For we do not begin to reason, except from experience. Every mind is organic and learns something, but with difficulty and in a very long time, namely, according to the recurrences of the things which minds sense. If our sensations were incoherent and confused for a long time, like the dreams of a sick man, and some of them did not return by a certain law, then we would for a long time be infants. The transmigration of souls is adequately refuted by recent experiments on the pre-formed foetus.[10] Does memory depend on the organs alone, or are signs and images necessary for it, as they are for thought? It cannot be denied that one mind has a more special relation to another portion of matter; how that comes about, has to be explained.

22 March 1676

395 I am perhaps the first to have shown that a being to which all affirmative

*[NOTE BY LEIBNIZ] An error.

primus. Hinc porro sequitur ipsum existere nam et existentia est at-
396 tributum affirmativum. Caeterum omnia attributa affirmativa non aliter compatibilia demonstro, quam absoluta pura et illimitata. Nam si limitibus modificentur, non sunt affirmativa, sed negativa quodammodo. Absoluta autem Existentia est aeternitas sive necessitas. Hinc statim sequitur ipsum non tantum existere, sed et necessario existere. Porro tale Ens esse unicum manifestum est. Nam duo illimitata si numero differant, etiam specie different quia different certe. Et recte D. Thomas substantias a materia separatas (qualis Deus est solus) statuit si plures essent, specie differe.

Si quis in ea haeresi sit, ut putet Deum posse, etiam quae a nobis impossibilia demonstrantur; eum ita convertam, age inquam amice, non de rebus et veritate; sed verbis et enuntiationibus loquamur, cum non tantum in ore et scriptis, sed et mente verba esse soleant. An mecum convenis, ut verborum tuorum significationes explices, item, ut sumta semel significatione constanter utaris; hoc posito statim ostendam tibi, non posse te dicere, v. g. ter tria facere decem, id est bis quinque, quin vocabulis aliter quam convenisti utaris. Nulla ergo enuntiatione eiusmodi uti debes (ne in mente quidem), nisi velis simul idem et eius oppositum dicere, quod est verborum usum tollere, nam ita quidvis aeque dicere licebit. Verborum ergo usus ex pacto in eo consistit, ut vocabulorum certa
397 significatione assignata nunquam de iis enuntiemus quod cum ea significatione pugnet, alioqui inter loquendum ludimus frustraque loquimur, cum nolimus intelligi certaque regula astringi. Hoc pacto ergo statim enuntiationes illas profligabo. Jam potestatem tibi do, si potes, sine enuntiationibus, id est sine verbis notisve cogitandi tales propositiones, si modo possis, inquam. Ego vero scio te non posse. Hoc enim verarum tantum propositionum proprium est, ut signis exui possint; caeteras sine signis nemo [intelliget] vel formare poterit, quod cum ex pacto rejectum sit, sequitur ut hominis qui mecum necessaria colloquio pacta inire, et postea pacto stare velit, mente propositiones falsas nunquam fore cum assensu, veras fore. Unde patet quantus sit usus caracterum, cum his solis possibile sit hominem utcunque pertinacem, modo necessaria colloquio pacta ineuntem servantemque convinci.

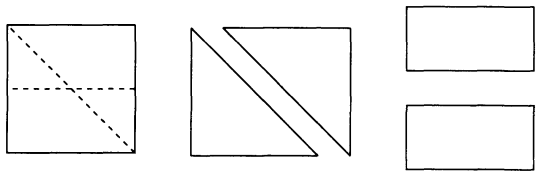
attributes belong is possible. From this it follows that it exists; for exis-
396 tence, too, is an affirmative attribute. Further, I prove that all affirmative attributes are compatible solely because they are absolute, pure, and unlimited. For if they are modified by limits they are not affirmative, but are in a way negative. But absolute existence is eternity or necessity. From this it immediately follows that such a being not only exists, but also exists necessarily. Further, it is evident that such a being is unique. For if two unlimited beings differed in number, they would also differ in species; for they certainly differ. And St. Thomas rightly judged[11] that substances which are separate from matter (as God alone is) would differ in species if there are several of them.

If anyone takes the heretical view that God can do even those things which are proved by us to be impossible, I would convert him as follows. "Come, my friend," I would say, "let us speak, not of things and of the truth, but of words and propositions: for words are usually not only spoken and written, but are also in the mind. I ask you to agree to explain the meanings of your words, and to use them consistently once a sense has been given to them. Once this has been granted I will show you at once that you cannot say (e.g.) that three times three makes ten, i.e., twice five, unless you use words in a way different from that which you have agreed on. You ought not to use any proposition of this sort—not even in the mind—unless you are willing to state at the same time something and its opposite, which is to destroy the use of words; for in that way it will be equally legitimate to say whatever one likes. Therefore the use of words in accordance with a convention consists in this: that when a certain meaning of words has been assigned, we never assert of them that which conflicts
397 with that meaning. Otherwise we play as we speak, and speak idly, for we are unwilling to be understood and to be bound by a definite rule. In this way, therefore, I overthrow those propositions immediately. I now grant you the power" (I would say) "of uttering such propositions, if you can, without words or signs. But I know that you cannot. For it is the property of genuine propositions[12] alone that they can be stripped of signs; as to the rest, no one can understand them or form them without signs.[13] But as this has been rejected by agreement, it follows that the mind of a man who is willing to enter into the necessary agreements with me in his discourse, and afterwards to stand by what he has agreed, will never contain false propositions together with an assent to their being true. From this it is evident what a great use symbols have; for by symbols alone it is possible for a man, however stubborn, to be convinced, provided that he has entered into the necessary agreements in his discourse and keeps to them."

8. Meditatio de Principio Individui

⟨1.⟩ April 1676

490 *Meditatio de principio individui.* Dicimus effectum involvere causam suam; id est ita ut qui perfecte intelligat effectum aliquem, etiam ad causae eius cognitionem perveniat. Utique enim necessaria quaedam inter causam integram et effectum connexio est. Sed contra obstat, quod diversae causae producere possunt eundem perfecte effectum, exempli causa, sive duo parallelogramma, sive duo [triangula], uti oportet, et hic apparet,



componantur, semper idem plane quadratum prodibit; quorum alterum ab altero nullo poterit discerni modo; ne a sapientissimo quidem; ita ut in nullius ne sapientissimi quidem potestate futurum sit, ex dato quadrato ejusmodi invenire eius causam, quoniam problema non est determinatum. Videtur ergo effectus non involvere suam causam. Quare si aliunde nobis certum sit, effectum involvere suam causam, necesse est in productis quadratis modum productionis semper discerni posse. Adeoque impossibile esse, ut duo quadrata eiusmodi sint perfecte similia, quia ex materia

491 constabunt, ea autem mentem habebit, et mens retinebit effectum status prioris. Et vero nisi fateamur, impossibile esse ut duo sint perfecte similia, sequetur, principium individuationis, esse extra rem in eius causa. Et effectum non involvere causam, secundum suam rationem specificam,sed secundum rationem individualem. Adeoque unum ab alio non differre in se. Sin fatemur semper duas res differentes, etiam in aliquo differe in se; sequitur materiae cuilibet adesse aliquid quod priorum effectum retineat, nempe mentem. Et hinc etiam probatur, effectum involvere causam. Verum enim de eo, eum productum a tali causa. Ergo adhuc impraesentiarum, eiusmodi in eo est qualitas, quae id ferat, quae etsi relativa, habet tamen aliquid a parte rei. Patet ex quantulis, quanta sequantur.

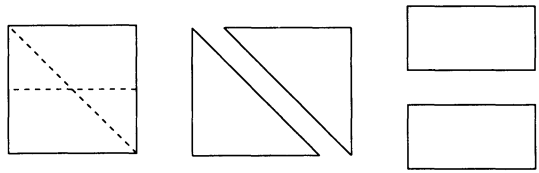
Pulcherrima ratiocinatio est, probatque, materiam non esse homogeneam, nec vero cogitari a nobis potest, quo differat, nisi mente. Cum

8. A Meditation on the Principle of the Individual

A, No. 67

1 April 1676

490 *A meditation on the principle of the individual.*[1] We say that the effect involves its cause; that is, in such a way that whoever understands some effect perfectly will also arrive at the knowledge of its cause. For it is necessary that there is some connection between a complete cause and the effect. But on the other hand there is this obstacle: that different causes can produce an effect that is perfectly the same. For example, whether two



parallelograms or two triangles are put together in the appropriate way (as is evident here) the same square will, as is clear, always be produced. Neither of these can be distinguished from the other in any way, not even by the wisest being. So, given a square of this kind, it will be in the power of no one—not even the wisest being—to discover its cause, since the problem is not determinate. The effect, therefore, seems not to involve its cause. So if we are certain, from some other source, that the effect does involve its cause, then it is necessary that the method of production must always be discernible in the squares that have been produced. And so it is impossible that two squares of this kind should be perfectly similar; for
491 they will consist of matter, but that matter will have a mind, and the mind will retain the effect of its former state. And indeed, unless we admit that it is impossible that there should be two things which are perfectly similar, it will follow that the principle of individuation is outside the thing, in its cause. It will also follow that the effect does not involve the cause in accordance with its specific reason, but in accordance with its individual reason, and therefore that one thing does not differ from another in itself. But if we admit that two different things always differ in themselves in some respect as well, it follows that there is present in any matter something which retains the effect of what precedes it, namely a mind. And from this it is also proved that the effect involves the cause. For it is true of it that it was produced by such a cause; therefore right up to the present there is in it a quality of such a kind as to bring this about,[2] and this quality, even though it is relative, has about it something that is real. It is evident what great consequences follow from such little premises.

This argument is very fine, and proves that matter is not homogeneous and that we cannot truly think of anything by which it differs, except the

Mens nostra intima adsit, sibi et materiae, sequitur nihil in iis introduci posse, quod non a nobis possit intelligi quodammodo. Principium magni momenti.

9. De Elementis Cogitandi

504 ⟨Probares:⟩ Si verum est dari aliquam demonstrationem perfectam, quae scilicet nihil sine probatione relinquat, necesse est dari Elementa cogitandi; tum enim primum perfecta erit demonstratio, cum resoluta erunt Omnia. Sed jam video id esse falsum. Et tum primum esse demonstrationem perfectam, cum ad identica perventum est, quod fieri potest, licet omnibus non resolutis; nam et non simplicissima, v. g. parabola, ternarius, de se invicem possunt enuntiari. Contra illud certum est, si Elementa sint cogitandi, certam esse scientiam; seu omnia posse demonstrari. Et contra si omnia possunt demonstrari, videntur aliqua esse cogitandi Elementa.

505 Omnia sophismata veterum pariter et recentiorum veniunt a detorta loquendi ratione. Nimirum, si quis loqui velit, is explicare debet ante omnia, quid vocabulo intelligat, et hanc observare legem, ut ne substituta definitione in locum definiti pugnantia oriantur; sed contra efficere, ut substituta definitione in locum definiti manifesta sive necessaria oriantur. Manifestum seu necessarium primum est, unumquodque esse id quod est, sive non esse id quod non est. Non dico in re quiddam tale esse, sed dico: hanc propositionem a nobis appellari necessariam *A est A*, et *A non est non A*, et *si A sit BC et [C] sit DE, A fore BDE*, had loquendi regulas ubi homines constituere; quicquid his consentaneum est, id vere dictum* ponunt.

Propositionem voco: *A est B*, vel *A non est B*. *A* vocamus subjectum, *B* praedicatum, *est* copulam. Per *A* autem et *B* quodlibet nomen nominativi casus intelligi potest. *Est B* simul, repraesentari potest verbo, ut *est sentiens*, id est *sentit*. Pro *est* aliquando dici potest *fuit, erit:* sed his missis redeamus ad simplex *A est B*, vel *si A est B, tunc et C est D*.

Propositio A est (non est) B. C est (non est) D. Si A est (non est) B, tunc C est ((non est)) D.

**over* vere dictum: necessarium

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**over* vere dictum: necessarium

mind. Since our inmost mind is present both to itself and to matter, it follows that nothing can be introduced in them which cannot be understood by us in some way. This is a principle of great importance.

9. On the Elements of Thinking

A, No. 70

1st half of April 1676[1]

504 You should have proved:[2] if it is true that there is some perfect demonstration, namely one that leaves nothing without proof, then it is necessary that there exist elements of thinking, for a demonstration will be perfect as soon as everything has been analyzed. But I now see that this is false, and that a demonstration will be perfect as soon as one has arrived at identical propositions, which can happen even though not everything has been analyzed.[3] For even terms which are not most simple—e.g., parabola, divisible by three—can be asserted of themselves. On the other hand, this is certain: if there are elements of thinking, then there is certain knowledge, i.e., everything can be demonstrated. And conversely if everything can be demonstrated, then there seem to be some elements of thinking.

505 All sophisms, both of the ancients and of more recent authors, come from a distorted way of speaking. It is indisputable that, if someone wishes to speak, he ought first of all to explain what he understands by a word, and to observe this law: that when a definition is substituted for a defined term, no contradictions occur. He should on the contrary bring it about that when a definition is substituted for a defined term there arises what is evident or necessary. The first thing that is evident or necessary is that everything is what it is, or, is not what it is not. I do not say that something of this sort really exists, but I do say that we call this proposition necessary: "A is A" and "A is not not-A" and "If A is BC and C is DE, then A will be BDE,"[4] when men have established these rules of speech. Whatever is consistent with this, they assume to be said truly.*

I call "A is B" or "A is not B" a proposition. We call "A" the subject, "B" the predicate, and "is" the copula. By "A" and "B" there can be understood any noun in the nominative case. "Is B" can be represented together by a verb; thus "is sentient," i.e., "senses." For "is" there can sometimes be said "was," "will be"; but leaving these aside let us return to the simple "A is B," or "If A is B, then also C is D."

A "proposition" is "A is (is not) B," "C is (is not) D," "If A is (is not) B, then C is ([is not]) D."

*Over "said truly" Leibniz has written "necessary."

Ratiocinari est facere propositionem ex aliis datis, substituendo pro aliquo termino in una datarum, eius praedicatum ex alia.

Convincere est ex concessis ratiocinari.

Demonstrare est ratiocinari ex concededsis,

Concedendae propositiones sunt, quas homines qui colloquntur concedere convenere, ut scilicet secum, cumque aliis possent utiliter loqui. Quam in rem necesse erat, ut is qui loqueretur, signa seu quibus utitur, per alia jam notae significationis explicaret, deinde ut recepta semel definitione constanter uti profiteretur proxime ut permissurum se diceret, ut
506 significatio in locum definiti et generaliter praedicatum in locum subjecti substitueretur; vicissim auditorem his assentiri necesse erat, si modo colloqui vellet. Sunt ergo propositiones concedendae, et ex ipsa sermonis necessitate.

Definitio: A est BC, declarante loquente se semper permissurum, ut *BC* pro *A* substituatur.

Propositio identica absoluta: A est A, A non est non A.

Propositio identica Hypothetica: si A est B, et B est C, tunc et A est C.

Operae pretium erit, ista rursus considera[re]. Homines secum aliisque [nunc] tacite nunc voce nunc scriptis, nunc etiam si vis nutibus aliisque signis colloquuntur. Signa quorum significatio sine declaratione non apparet, declaranda sunt. Declaratio fit vel aliis signis jam cognitis, vel rebus ipsis quae significandae sunt, aut earum exemplis ostensis. Et is qui declarat signum, se eo aliquandiu hoc sensu usurum profitetur, quem explicuit. Declaratio autem illa verbis facta est *definitio*. Usus verborum porro non in eo tantum consistit, ut significent, sed et ut alicuius gratia significent. Cumque nos aliosque verba usu recepta experiamur certo modo conjungere, unumque alteri substituere; quod Propositionem vocamus; nihil enim aliud est dicere *A est B*, quam *ego permittam ut B substituatur in locum A;* ideo efficere conamur, ut alii, imo et imposterum nos ipsi (quos eo modo velut nos ipsos consideramus) eodem semper modo verba conjungamus: ita enim fiet ut in posterum cogitandi colloquendique labor minuatur, possumusque varia ac diversa inter se statim connectere. Hoc autem efficere est *probare*. *Probare* itaque propositionem est efficere ut aliquis ea constanter utatur, id est ut praedicatum in subjecti

To "reason" is to make a proposition out of other propositions which are given, by substituting for some term in one of the given propositions its predicate from another proposition.

To "convince" is to reason from what is granted.

To "demonstrate" is to reason from what ought to be granted.

Those propositions "ought to be granted" which those who speak with one another have agreed to grant, in order that they can speak usefully both with themselves and with others. To this end it was necessary that the person who speaks should explain the signs which he uses by means of others whose meaning is already known; further, that once a definition has been accepted he should declare that he will use it consistently,[5] and next
506 that he should say that he will permit the meaning to be substituted for a defined term, and in general a predicate for a subject. Conversely, it was necessary that the hearer should agree to this, if he wished to speak with the other. There are, therefore, propositions which ought to be granted, out of the sheer necessity of speech.

A "definition": "A is BC," the speaker declaring that he will always permit "BC" to be substituted for "A."

An "absolute identical proposition": "A is A," "A is not not-A."

A "hypothetical identical proposition": "If A is B, and B is C, then A is C."

It will be worth while to consider these matters again.[6] Men converse with themselves and with others now silently, now vocally, now in writing, now (if you please) even by nods and other signs. Signs whose meaning is not apparent without explanation are to be explained. An explanation is made either by other signs which are already known, or by showing the things themselves which are to be made known, or examples of them. And the man who explains a sign declares that he will use it for some time in the sense which he has explained. That explanation, made in words, is a "definition." But the use of words consists not only in the fact that they have meaning, but also in the fact that they have meaning for the sake of someone. And as we have experience of the fact that we and others join together words that have a received use in a certain way and substitute one for the other, and call this a "proposition" (for to say "A is B" is the same as saying, "I permit 'B' to be substituted for 'A'"), we therefore try to bring it about that in the future others and ourselves (in this way we consider others as if they were ourselves) always join words together in the same way. For in this way it will come about that in the future the labour of thinking and of conversing is lessened, and we can immediately connect various different things among themselves. But to do this is to "prove." Therefore to "prove" a proposition is to bring it about that someone uses it

locum substituat. Hoc autem duobus fit modis, vel ratiocinatione, vel ostensione. *Ratiocinari* est propositionem unam facere ex aliis, substituendo scilicet in locum alicuius termini, in aliqua propositione positi, id quod in alia propositione eius praedicatum. Quodsi propositiones quae
507 assumuntur sunt concessae, ratiocinatio est *convictio,* si vero sint concedendae, ratiocinatio est *demonstratio.* Concedendae Propositiones sunt, eae quibus non concessis frustra instituitur sermo. Nempe *A est A,* et *A non est non A.* Deinde *si A est B, A non erit non B.* Nam si ista non admitterentur, nihil certi loqueremur, et pari jure posset quidlibet dici. Hoc amplius. *Si A est B et B est C, etiam A est C,* nam hoc ipsum volumus, cum facimus propositiones, scilicet praedicatum in subjecti locum substitui posse. Denique *A est BC,* et *BC est A* posito *BC* esse definitionem ipsius *A.* Denique quoties mihi loquor, concedenda apud me propositio est: *Ego sum conscius huius illiusve, quod scilicet sentio.* Quicquid ergo hoc modo demonstratum erit, illud verum dicemus.

10. De Veritatibus, de Mente, de Deo, de Universo

15 April. 1676

508 Primae apud me veritates quae probari non possunt, ut: Ego habeo apparentias tales vel tales. Item: *A est A,* et definitiones. Ex apparentiarum perceptione sequitur et esse me, et variarum apparentiarum seu varietatis perceptionum esse causam aliam ab ea cuius for[mam] percipio, cum percipio cogitationem. Fateor tamen propositionem *Ego cogito,* prius occurrere debere ordine [philosophanti,] seu si primae veritates reales disponantur, ordine primam fore, quia simplicius est ab uno subjecto primae propositionis experimentalis incipere, quam a variis illis praedicatis. Cartesius non resolvit ad intima usque seu primas formas, id est non incepit a Deo.

Haec propositio: quod clare distincteque peripio, illud est verum, non potest probari nisi quatenus ostenditur redire ad hanc: *propositio omnis identica vera est,* item *Definitio de definitione.* Itaque non est opus Cartesio metuere ne Ens aliquod sit, quod nos fallat, aut falli patiatur. Illud interea fatendum est demonstrationum longius protractarum non esse nisi moralem certitudinem, quae scilicet uno mentis actu totae perviderи non possunt. Nam verum quidem est me quid clare distincteque percipere, et

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consistently, i.e., that he substitutes the predicate in place of the subject. This is done in two ways: either by reasoning, or by ostension. To "reason" is to make one proposition out of others, namely by substituting for some term, posited in some proposition, that which in another proposition
507 is its predicate. If the propositions which are assumed are granted, the reasoning "produces conviction";[7] but if they ought to be granted, the reasoning is a "demonstration."[8] Those propositions are to be granted which are such that, if they are not granted, speech is undertaken in vain: namely, "A is A," "A is not not-A," and finally "If A is B, A will not be not-B." For if these are not granted we say nothing that is definite, and anything whatever could be said with equal justice. To take this further:[9] "If A is B and B is C, A is also C," for this is what we intend when we form propositions, namely that the predicate can be substituted for the subject. Finally, "A is BC" and "BC is A," granted that "BC" is the definition of "A." Finally, as often as I speak to myself, I must grant this proposition: "I am conscious of this or that, namely that which I sense." So whatever is demonstrated in this way, we shall call true.

10. On Truths, the Mind, God, and the Universe

A, No. 71

15 April 1676

508 In my view, the primary truths are those which cannot be proved, such as "I have such and such appearances";[1] also "A is A" and definitions. From the perception of appearances it follows both that I exist and that there is a cause of the various appearances, i.e., of the variety of perceptions, which is different from that whose form I perceive when I perceive thought. But I admit that the proposition "I think" must occur first in the order of philosophising; that is, if the primary truths are arranged in order, it will be the first. For it is simpler to start from the one subject of a primary proposition of experience than from its various predicates. Descartes did not take his analysis to what is most profound, i.e., to primary forms; that is, he did not start from God.[2]

The proposition, "That which I perceive clearly and distinctly is true"[3] cannot be proved unless it is shown to come to "Every identical proposition is true" and also "A definition is asserted of a definition." So there is no need for Descartes to fear that there may be some being which deceives us, or allows us to be deceived. Meanwhile, one must admit this: one has only moral certainty in the case of demonstrations which are protracted, such that they cannot be surveyed in their entirety by one act of the mind. For it is true that I am perceiving something clearly and distinctly and that I

certum mihi impraesentiarum, sed nullam habeo certitudinem, quod omnia clare distincteque intellexerim. Prorsus ut si calc[ulum] prolixum scribam in charta, ubi non nisi per continuas aequationum identicarum Catenas, seu substitutiones valorum procedam; pone me id facere, unde tamen certus sum calculo finito me id semper fecisse, res enim a fide memoriae meae pend[et,] quae fallax. Possum repetere calculum, unde si idem redit quod ante magna probabilitas, sed non certitudo, nec si calculum in carta scribam, absoluta inde haberi potest certitudo, quoniam nec absolute quidem certi sumus de existen[tia] ullius cartae. Et si saepe repetam singulae repetitiones iisdem difficultatibus subjectae, quamvis [ipse] repetitionum consensus magnum argumentum. Etsi omnia verisimilia tantum.

Cum quod a nobis judicari potest de existentia rerum materialium, nihil aliud sit, quam sensuum congruentia satis judicari potest nihil aliud a nobis materiae tribui posse, quam sentiri secundum quasdam leges certas, quarum tamen fateor rationem quaerendam superesse.

509 Cartesius dicit omnia clare distincteque intelligenda, omnia in partes apte dividenda, etc., sed horum viam [et] rationem nullibi explicat. Cum tamen horum omnium vera sit lex, ut agamus, quasi cogitationes nostras scribere ac figere vellemus (quod utile et pro machinis et pictura); singulos terminos resolvamus quibus in sermone interiore utimur, quaeramus definitiones, et definitionis partium definitiones, usque ad terminos indefinibiles. Si quis definitionibus utatur qualibuscunque, modo alias adhibeat voces, plures pro una, easque rursus eodem modo resolvat, cavendo tantum ne intret definitum in definitionem, et ita pergat, usque ad inexplicabilia, seu ea quae sentiuntur, seu quae, existere nemini certo probari possunt amplius, ne nobis quidem ipsis, tunc semper lucrabitur, etsi forte definitiones eius cum usu populi non semper conveniant. Non est semper opus resolutione ad ultima pro demonstrandis theorematibus. Haec est potissima ars eligendi, ut scilicet resolvamus non ultra quam opus.

In Mente nostra est perceptio seu sensus sui, ut certae cuiusdam rei particularis, haec semper in nobis, quia quoties vocabulum adhibemus, tunc id statim agnoscimus. Quoties volumus agnoscimus nos cogitationes nostras percipere, id est cogitasse paulo ante. Ergo memoria intellectualis

am certain for the present; but I have no certainty that I *have* understood everything clearly and distinctly. It is just as if I were to write a lengthy calculation on paper, where I proceed only by continuous chains of identical equations, i.e., by substitutions of values. Grant that I do this: how can I be certain, in a finite calculation, that I have always done this? For the issue depends on the trustworthiness of my memory, and memory is fallible. I can do the calculation again, and if the result is the same as before then there is a strong probability, but there is no certainty. Not even if I write my calculation on paper can I acquire absolute certainty, for we are not absolutely certain of the existence of any piece of paper. And if I repeat the process often, the individual repetitions are subject to the same difficulties, even though the consensus of the repetitions is a great argument.[4] And yet all things are only probable.

Since what we can judge about the existence of material things is no more than the consistency of our senses, one has a sufficient basis for judging that we can ascribe nothing to matter apart from being sensed in accordance with some certain laws, whose reason (I admit) remains to be sought.

509 Descartes says that everything is to be understood clearly and distinctly, that everything is to be divided suitably into parts, etc.[5] But nowhere does he explain the way in which, or the method by which, these things are to be done. But since the true law of all these things is that we should act as if we wanted to write down and fix our thoughts (something which is useful both for machines and for picturing), let us therefore analyze the particular terms which we use in interior speech; let us seek definitions, and definitions of the parts of a definition, right up to indefinable terms. If anyone uses definitions of any kind, provided that he employs other words, several for one, and analyzes them again in the same way, taking care only that the defined term does not enter into the definition, and proceeds in this way right up to those things which cannot be explained—i.e., to those which are sensed, or, whose existence cannot be proved with greater certainty by anyone, not even by ourselves—then he will always gain, even though his definitions may perhaps not always agree with popular usage. It is not always necessary to provide an analysis into what is ultimate in order to demonstrate theorems.[6] This is the most important art of choice—namely, that we do not analyze further than is necessary.

In our mind there is a perception or sense of itself, as of a certain particular thing. This is always in us, for as often as we use a word, we recognize that immediately. As often as we wish, we recognize that we perceive our thoughts; that is, we recognize that we thought a short time ago. Therefore intellectual memory consists in this: not *what* we have

in eo est, non quid senserimus, sed quod senserimus: quod simus ii qui sensimus, et hoc est quod vulgo appellamus idem, haec in nobis facultas independens ab externis. Non video quomodo homo seu mens mori seu extingui possit durantibus illis reflexionibus. Manet aliquid in modificationibus non ut ipsa per se extensio in spatio, sed ut quiddam particulare, certis modificationibus praeditum, quod scilicet haec vel illa percepit. Hic sensus sui particularis est sine aliis characteribus, quod probe notavi, cum cogitarem reflecteremque diu in me ipsum continuis in reflexionem reflexionibus, est quaedam quasi obs[t]upescentia et admiratio huius reciprocationis. Videturque ille sensus sui semper esse, quia semper post statim percipitur nos fuisse qui sensimus. Si hoc est natura mentis, consistitque in sensu sui: utique non video quomodo ille possit impediri aut destrui, praeterquam ut paulo ante dixi quia modificationibus aliquibus mentis identitas non destruitur, ergo nullis ut facile ostendi potest. Ergo ita sentio, soliditatem seu unitatem corporis esse a mente, tot esse mentes,
510 quot vortices, tot vortices, quot corpora solida, corpus resistere, hanc resistentiam esse sensum. Resistit scilicet dividere conanti. Sensus quaedam reactio est. Corpus incorruptibile pariter ac mens, varia circa ipsum organa varie mutantur. Videtur danda opera homini, ut moriatur contentus. Credible est cogitationibus maxime postremis insisti. Ergo qui contentus moritur, credibile est manere. Mea sententia, omnia vera Entia seu Mentes, quae sola una, crescere perfectione semper. Omnium impressionum aliquem effectum esse in infinitum, quae scilicet in corpore fiant. Mentes aliquandiu fore in se reductas, aliquando forte ad sensum externorum, forte alterius longe naturae redituras. Omnium mundi globorum cum omnibus aliquando commercium fore. Productas semel in hoc theatrum mentes, magis magisque proficere. Non est credibile, fore ut omnium perceptionum effectus evanescat, cum tamen omnium aliarum actionum effectus duret semper, fieret autem extincta mente. Itaque Spinosae sententiam non probo, quod Mens singularis cum corpore extinguatur, quod Mens ullo modo meminerit praecedentium, quod supersit tantum id quod in Mente aeternum est, corporis Idea vel essentia, huius scilicet. Et hoc esse quod supersit in mente, hoc enim posito primum mente singulari extincta nihil fiet novi, haec enim essentia jam est; deinde quolibet momento alia atque alia mens extincta in aliam atque aliam

perceived, but *that* we have perceived—that we are those who have sensed. And this is what we commonly call "the same," this faculty in us which is independent of external things. I do not see how a man, or, a mind, can die or be extinguished as long as these reflections endure. Something remains in its modifications—not as extension *per se* remains in space, but as something particular, endowed with certain modifications, which has perceived this or that. This particular sense of oneself is without other characteristics, as I have noted well; when I think and reflect on myself for a long time, with continuous reflections on a reflection, there is, as it were, a kind of amazement, and a wondering at this reciprocation. It seems that this sense of oneself always exists, since immediately afterwards it is perceived that it was we who perceived. If this is the nature of the mind, and it consists in the sense of itself, then I do not see how that sense can be impeded or destroyed. Furthermore, since (as I said a little before) the identity of the mind is not destroyed by some modifications, it cannot therefore be destroyed by any, as can easily be shown. So my opinion is this: that the solidity or unity of the body comes from the mind; that there are as many minds as there are vortices; that there are as
510 many vortices as solid bodies; that a body resists, and that this resistance is sensation. That is to say, a thing resists that which endeavours to divide it. Sensation is a kind of reaction. A body is as incorruptible as a mind, but various organs around it are changed in various ways. It seems that a man ought to act in such a way that he dies content. It is credible that one persists in one's very last thoughts. So it is credible that the man who dies content, remains content.[7] It is my view that all true entities or minds, which alone are one, always increase in perfection; that there is some effect of all the impressions occurring in a body, which proceeds to infinity; that minds will for a while be withdrawn within themselves and will perhaps at some time return to a sensation of external things, perhaps of a far different nature; that at some time or other all the globes of the world will communicate with each other; that minds, once they are brought into this theatre, advance more and more. It is not credible that the effect of all perceptions should vanish in the future, even though the effect of all other actions endures for ever; but this would happen if the mind were extinguished. So I do not accept the view of Spinoza, that the individual mind is extinguished with the body;[8] that the mind in no way remembers what has gone before; that there remains only that which is eternal in the mind,[9] i.e., the idea or essence of the body—namely, of *this* body—and that it is this which survives in the mind. For if this is granted, then first, once a particular mind is extinct nothing new will come to be, for this essence already exists; then again, now this and now that extinct mind will at each

essentiam desinet, nec magis ultimae extinctionis residuum quam intermediarum ad nos pertinebit, sed quod valde considerandum nihil omnino ad nos pertinebit, quod tunc supererit, nam nec recordabitur, nec nos eius sensum habemus, et frustra in nostra mente perficienda laboramus pro statu post mortem, quia essentia illa ultima perfecta, quae sola supererit morientibus nobis, nihil [ad] nos. Nam etsi nihil pro perfectione nostra laboraremus, non minus illa essentia jam fuit et nunc est, quippe aeterna, frustra ergo laboratur in perfectione mentis. Cum contra sententia mea sit rationis esse, ut perfectio mentis non frustra quaeratur.

In D. Thomae *summa contra Gentes* capite: *an Deum esse sit per se notum,* elegans quorundam refertur argumentum pro probanda Dei existentia: Deus est, quo nihil maius cogitari potest. At vero quo nihil maius cogitari potest; id non potest non esse. Nam aliud quod non potest non esse, eo maius foret. Ergo Deus non potest non esse. Argumentum in idem
511 recidit cum eo quod ab aliis saepe allatum est, Ens perfectissimum existere. D. Thomas hoc argumentum refutat, mihi videtur non esse refutandum, sed indigere supplemento, suppon[it] enim Ens quod non potest non esse, item Ens maximum seu perfectissimum esse possibilia.

Re recte expensa, tantum illud certum est nos sentire, et sentire congruenter, et quandam in sentiendo observari a [no]bis regulam. Congruenter sentiri est ita sentiri ut omnium ratio reddi possit, omniaque praedici. Et in hoc consistit existentia, in sensu [certas] quasdam leges servante, nam alioqui omnia essent velut somnia. Porro quod plures idem sentiunt, et consentientia sentiunt; [et divers]ae mentes se suosque effectus sentiunt. Hinc sequitur eandem esse causam, quae illos nostrosque causet sensus. Non tamen ideo necesse est, aut nos in illos agere aut illos in nos, sed tantum conformia sentire, idque necessario ob causam eandem. Porro necesse non est realitate differre quadam intrinseca somnum a vigilia, sed tantum forma sive ordine sensionum, unde non est cur quaeramus an sint quaedam corpora extra nos, an spatium sit aliquod et aliquae huiusmodi, horum enim terminos non satis explicamus. Nisi scilicet dicamus corpus a

moment end in now this and now that essence, nor will the residue of the latest extinction belong to us any more than the residue of the intermediate extinctions. But what is particularly to be considered is this: that what will survive then will in no way belong to us, for it will not be remembered, nor shall we have any sensation of it, and we labor in vain to perfect our mind on behalf of its state after death. For that ultimate perfect essence, which is all that will survive when we die, is nothing to us. For even if we do not labor for the sake of our perfection, none the less that essence already has existed and now exists, since it is eternal. So one labors at the perfection of one's mind in vain. My view, on the contrary, is that it is rational that the perfection of the mind should not be sought in vain.

In the chapter of St. Thomas' *Summa contra Gentiles* which is entitled, "Whether the existence of God is known *per se*,"[10] there is a reference to an elegant argument which some use to prove the existence of God. The argument is: God is that than which nothing greater can be thought. But that than which nothing greater can be thought cannot not exist. For then some other thing, which cannot not exist, would be greater than it. There-
511 fore God cannot not exist. This argument comes to the same as one which has often been advanced by others: namely, that a most perfect being exists. St. Thomas offers a refutation of this argument,[11] but I think that it is not to be refuted, but that it needs supplementation. For it assumes that a being which cannot not exist, and also a greatest or most perfect being, is possible.

On due consideration, only this is certain: that we sense, and that we sense in a consistent way, and that some rule[12] is observed by us in our sensing. For something to be sensed in a consistent way is for it to be sensed in such a way that a reason can be given for everything and everything can be predicted. This is what existence consists in—namely, in sensation that involves some certain laws; for otherwise, everything would be like dreams. Further, it consists in the fact that several people sense the same, and sense what is coherent; and different minds sense themselves and their own effects. From this it follows that there is one and the same cause which causes our own and others' sensations. But it is not therefore necessary that we act on them or they act on us, but only that we sense what is consistent; and necessarily so, on account of the sameness of the cause. Further, it is not necessary that a dream differs from waking experience by some intrinsic reality, but it is only necessary that they differ in form or in the order of the sensations. Therefore there is no reason why we should ask whether there exist certain bodies outside us, or whether space exists, and other things of this sort; for we do not explain adequately the terms that are involved here. Unless, that is, we say that we call a

nobis appellari, quicquid percipitur congruenter, spatium id quod facit ut plures perceptiones inter se cohaereant simul, ut si tanto itinere perveniam in certum locum, et alio ad alium, et tertio ad tertium, et rursus ab uno horum ad aliud, tunc ex his colligo quanto tempore perventurus sim ab uno reliquorum ad aliud reliquorum ex supposita unitate spatii, spatii ergo idea in eo recognoscitur, quo scilicet somniorum locum et velut Mundum a nostro separamus. Quae cum ita sint non ideo tamen hinc sequitur, aliud esse quam sensum, et huius sensus congruentiaeque causam. Hinc porro sequitur infinita alia Spatia Mundosque prorsus alios esse posse, ita ut inter hos nostrosque nulla futura sit distantia, si scilicet sint quaedam mentes quibus alia appareant nihil congruentia cum nostris. Prorsus ut Mundus et spatium somniorum differt a nostro, possent in eo aliae esse leges motus. Ex his patet tantum abesse, ut res materiales sint realiores aliis, ut contra de earum existentia semper possit dubitari, aut potius nihil differt materialiter, seu in se eorum existentia, ab existentia somniorum, etsi scilicet pulchritudine differant. Cum e somniis evigilamus plus con-
512 gruentiae invenimus in corporum gubernatione, sed tamen non et in gubernatione Mentium, seu optima Republica, et fieri potest, ut aliquando etiam ab huius vitae somno evigilantes, veniamus in Mundum perfectiorem; etsi fieri etiam possit ut per periodos rursus obdormiscamus seu ad hanc vitam aliamque ei similem redeamus. Quicunque quaerit an alius possit esse mundus, aliud spatium, is hoc tantum quaerit, an aliae sint mentes nihil nostris communicantes. Ex his facile intelligi potest non esse necesse, certe non posse ex iis quae sentimus probari aeternitatem Mundi; tametsi enim semper Mens aliqua necessaria sit, et non possit intelligi, quomodo mens aliqua coeperit, et desinat, quod ad corporea tamen semper intelligi potest, aliquando hunc Mundum incepisse; id est sensus hoc modo congruentes.

Si Mens quaedam nihil cogitet particulare, sed cogitet tamen, erit Deus; seu cogitabit omnia. Si Mens incipere potuit, poterit extingui. Et quemadmodum facta est ex Deo, redibit in Deum. Haec foret sententia Aristotelicae consentiens, et iis qui de intellectu universali. Mihi contra videtur, nullam unquam animam cepisse, aut desinere posse. Non ideo tamen minus Mens creabitur a Deo, quia erit et subsistet Dei voluntate, id est

"body" whatever is perceived in a consistent way, and say that "space" is that which brings it about that several perceptions cohere with each other at the same time—so that if, by a journey which is so long, I arrive at a certain place, and by a journey of another length at another place, and by a third journey at a third place, and again from one of these to another, then from these I infer how long it will take me to arrive, from one of the remaining places, at another of the remaining places, from the assumption of the unity of space. Therefore the idea of space is recognised by this: namely, that it is that by which we separate the place and, as it were, the world of dreams from our own. As this is so, it does not follow that there exists anything but sensation, and the cause of this sensation and of its consistency. From this it follows that infinitely many other spaces and other worlds can exist, in such a way that between these and ours there will be no distance, if there exist certain minds to which other things appear which are in no respect consistent with ours. Further, just as the world and space of dreams differ from ours, so there could be different laws of motion in that other world. From this it is evident that so far is it from being the case that material things are more real than others, but that on the contrary one can always doubt of their existence; or rather, they do not differ materially, i.e., in their existence in themselves, from the existence
512 of dreams, even though they differ in beauty. When we awaken from our dreams we find more consistency in the control of our bodies, but not in the control of our minds, i.e., in the best republic; and it can happen that when at some time we awaken even from the sleep of this life, we shall come into a more perfect world. Though it can also happen that for certain periods we fall asleep again, i.e., that we return to this life and to another which is like it. Anyone who asks if there can be another world, or another space, is simply asking if there are other minds which have no communication with ours. From this it can easily be understood that the eternity of the world is not necessary; indeed it cannot be proved from what we sense. For although some mind is always necessary, and it cannot be understood how a particular mind can begin and end, yet as far as corporeal things are concerned it is always intelligible that this world should have begun at some time; that is, that there are sensations which cohere in this way.

If some mind thinks nothing in particular, but thinks nevertheless, it will be God, or, it will think all things. If the mind could have begun, it will be able to be extinguished; and just as it was made by God, so it will return to God. This would be a view which agrees with that of Aristotle, and of those who speak of a universal intellect.[13] To me, on the other hand, it seems that no soul has ever begun, or can cease. But the mind will nonetheless be created by God, since it will exist and remain by the will of

intellectus boni. Ipsum enim esse, nihil aliud est, quam bonum intelligi. De corporibus et Mente nostra ipsum esse aequivoce dicitur, nos esse sentimus seu percipimus: corpora esse cum dicimus, id volumus sensiones quasdam esse congruentes, causam habentes constantem particularem. Uti aliud est ternarius, aliud 1, 1, 1, est enim 1 + 1 + 1. Et adhuc aliud est forma ternarii ab omnibus partibus; ita et res differunt a Deo, qui est omnia. Creaturae sunt quaedam.

Posito sensum nostrum fore eo magis congruentem quo fuerit exquisitior, sequitur spatium esse infinitum, Mundumque, et si semper fuisset, congruens sensus noster, si exquisitus, sequitur Mundum fore aeternum. Itaque opinio de Mundo aeterno et infinito nititur probabilitate de perpetua rerum congruentia quoad nos; seu de causa earum semper invenienda et consensu, si nobis inquirendi satis otium esset. Nondum ex his sequitur non esse alium Mundum seu alias Mentes, aliter inter se congruentes non nobis. Caeterum satis hinc patet spatium differre a Deo, quia plura spatia esse possent, Deus Unus, eadem tamen in omnibus Dei immensitas. Sed quoniam spatium in continua est mutatione unumquodque scilicet et in utroque aliquid persistit, an haec duo persistentia a se invicem differunt; an vero eadem in utroque velut idea seu natura univer-
513 salis? Ita puto. Et haec natura facit ut Deus illi pariter ac huic mundo sit praesens, posset enim in illo Mundo alia esse Lex naturae. Valde considerandum; si poneremus quodlibet corpus rursus in minora actu resolutum esse; seu si ponantur semper alii in aliis Mundi, an ideo divisum sit in Minimas partes. Itaque aliud est sine fine divisum et in minima divisum esse. Scilicet pars ultima erit nulla. Quemadmodum in linea interminata punctum ultimum est nullum. Ut si corpus ponamus in tot esse partes divisum quot sunt pedes in linea interminata, non ideo erit in minimas divisum, nam in plures divideretur, si in tot quot sunt digiti in eadem. At si inciperet motus in liquido homogeneo, absolute in minimas divideretur, quia ratio nulla foret cur non in minores.

Unum per se corpus facere ⟨dur⟩itiem, forte nec a Cartesii sententia abhorruit.

God, that is, by the will of a good intellect. For to exist is simply to be understood to be good. Existence is stated equivocally of bodies and of our mind. We sense or perceive that we exist; when we say that bodies exist, we mean that there exist certain consistent sensations, having a particular constant cause. Just as the number 3 is one thing, and 1, 1, 1 is another—for 3 is 1 + 1 + 1, and to this extent the form of the number 3 is different from all its parts—in the same way creatures differ from God, who is all things. Creatures are some things.

Given that our sensation will be the more consistent the more carefully studied it is, it follows that space is infinite, as is the world; and if our sensation has always been consistent, if carefully studied, then it follows that the world will be eternal. So the thesis of the eternity and infinity of the world rests on the probability of the perpetual consistency of things as far as we are concerned—i.e., on the cause of these things and their harmony being always discoverable, if we had time enough for our inquiries. But it does not follow from this that there is not another world, or, other minds which cohere among themselves in a way which is different from that which holds in our case. However, it is clear enough from this that space differs from God, since there could be several spaces, but there is one God, and the immeasurability of God in all things is the same. But since each space is in continuous change, and in each of two spaces something persists, do these two persistent things differ from each other,
513 or is there, as it were, the same idea or universal nature in each? I think that there is. And this nature brings it about that God is equally present both to this and to that world, for there could be a different law of nature in that world. We must consider this in particular: Suppose we assume that any body one pleases is actually broken down into smaller parts, or if it is assumed that some worlds are always in others, is a body therefore divided into least parts? So it is one thing to be divided without end, and another to be divided into least parts. Evidently there will be no last part, just as in a line which has no end there is no last point. Thus if we assume that a body is divided into as many parts as there are feet in a line which has no end, it will not therefore be divided into least parts; for it would be divided into more parts, if it were divided into as many parts as there are inches in the same line. But if motion were to begin in a homogeneous liquid, it would be absolutely divided into least parts, since there would be no reason why it should not be divided into smaller parts.

That one body *per se* constitutes hardness was perhaps not inconsistent even with Descartes' view.[14]

11. De Formis Seu Attributis Dei

513 Extensio et cogitatio sunt specialiores quaedam formae. Nam existentia, duratio, etc. sunt communes. Competit et cogitanti et extenso durare; sed mirum quid hoc sit aliam formam alia esse specialiorem. Itaque formae in eo differunt, quod aliae relativae magis minusve; exempli causa, cogitatio habet et subjectum et objectum, extensio habet subjectum tantum. Videtur tamen ipsa per se conscientia sui esse quiddam quemadmodum extensio
514 per se, scilicet status, tunc enim subjectum et objectum idem. Si verum est memoriam sine vestigiis esse nullam, et vestigia cogitationum de rebus incorporalibus in corpore non sunt naturalia sed arbitraria (neque enim ulla inter incorporeum et corporeum necessaria connexio repraesentandi) seu characteres; sequitur nullam esse scientiam neque ratiocinationem sine characteribus, quoniam omnis ratiocinatio vel demonstratio fit per memoriam praemissarum. Memoria autem sine characteribus aut imaginibus nulla, ut supposuimus. Motus celerrimus esse non potest, quia mutatio loci, unde terminatio etc. At cogitationem perfectam seu omnium esse nil impedit.

Mira res, aliud esse subjectum quam formas seu attributa. Idque necesse est, quoniam de formis ob ipsarum simplicitatem nihil potest dici, ergo nulla propositio foret vera nisi unirentur formae subjecto. Cogitatio non est duratio, sed cogitans est durans. Et haec est differentia substantiae a formis. Videndum an recte dicatur cogitationem durare, mutari [,] esse. Motum esse alio majorem. Aliquam ipsius Numeri et rationis esse rationem. Attributum Dei est, forma simplex quaelibet. Necessario sunt formae simplices seu perceptiones per se, quia quae per alia percipiuntur; si haec rursus semper per alia, perciperetur nihil. Ea in quibus varietas, ut color, cur a nobis non percipiantur distincte ratio est, quia tempore aliquo certo colorem percipimus; cum tamen id tempus in infinitas partes subdividi possit, et qualibet eius parte aliquid ad rem pertinens egerimus, sed non meminimus, ob organorum defectum. Sed ea quae uno actu percipiuntur, ut esse, perceptio, extensio, ea perfecte intelliguntur.

Attributa Dei infinita, sed eorum nullum essentiam Dei involvit totam; nam essentia Dei in eo consistit, ut sit subjectum omnium attributorum compatibilium. Quaelibet vero proprietas sive affectio Dei totam eius essentiam involvit; ut Deum certum aliquid nobis sensu constans produxisse, quantulumcunque sit, totam involvit naturam Dei; quia totam invol-

11. On Forms, or, the Attributes of God

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513 Extension and thought are certain more special forms. For existence, duration, and so forth are common forms; duration belongs both to that which thinks and to that which is extended. But it is extraordinary that one form should be more special than other. So forms differ in this: that some are more or less relative. For example, thought has both a subject and an object, but extension has a subject alone. But it seems that self-awareness

514 *per se,* like extension *per se,* is something, namely a state; for then subject and object are the same. If it is true that there is no memory without traces, and the traces in the body of thoughts about incorporeal things are not natural but arbitrary, i.e., are symbols (for there is no necessary representational connection between the incorporeal and the corporeal), then it follows that there is no knowledge or reasoning without symbols, since all reasoning or demonstration takes place by means of the memory of premises. But there is no memory without symbols or images,[2] as we have assumed. There cannot be a most rapid motion, since there is a change of place, whence there is a fixing of bounds, etc.[3] But nothing hinders the existence of perfect thought, i.e., thought of everything.

It is a wonderful fact that a subject is different from forms or attributes. This is necessary, because nothing can be said about forms on account of their simplicity; therefore there would be no true proposition unless forms were united to a subject. Thought is not duration, but that which thinks is something that endures. And this is the difference between substance and forms. One must see if it is right to say that thought endures, changes, exists; that one motion is greater than another; that there is some ratio of number itself, and of ratio.[4] An attribute of God is any simple form. There necessarily exist simple forms, i.e., perceptions *per se.* For there are things which are perceived through other things; if the latter were again always perceived through other things, then nothing would be perceived. The reason why those things in which there is some variety, such as color, are not perceived distinctly by us is that we perceive a color at some certain time; but this time can be subdivided into infinitely many parts, and in any part of this time we have done something that is relevant to the matter at issue, but we do not remember it because of a defect of our organs. But those things which are perceived by one act—such as being, perception, extension—are perfectly understood.

The attributes of God are infinite, but none of them involves the whole essence of God, for the essence of God consists in the fact that he is the subject of all compatible attributes. However, any property or affection of God involves his whole essence; thus, that God has produced something that is constant in our sensation, however small it may be, involves the

vit seriem rerum illius generis. Infinita autem series non nisi ex infinitis resultat attributis. Ad quodlibet attributum dum alia referuntur omnia, resultant in eo modificationes, unde fit ut eadem Essentia Dei in quolibet Mundi genere expressa sit tota adeoque Deus infinitis se manifestet modis.

Quicquid per se concipitur eius non potest intelligi causa. Quia effectus concipitur per suam causam. Ergo jam illud patet, si sit per se, item si alia sint, ipsum esse. Re recte expensa, formae per se concipiuntur, subjecta
515 per formas, et hoc quod sint subjecta. Sed illud cuius modificationes pendent ex attributis alterius, in quo scilicet continentur omnia requisita eius; id utique per alterum concipitur. Id est non nisi altero intellecto perfecte intelligi potest. Connexa sunt quorum alterum sine altero intelligi non potest. Requisita sunt quae alteri connexa non contra. Ratio est summa requisitorum. Sensibilia perfecte intelligi non possunt a nobis, quoniam ad eorum constitutionem concurrent infinita, ob temporis et loci divisibilitatem in infinitum. Unde fit ut perceptio qualitatis sensibilis non sit una perceptio sed aggregatum infinitarum.

Deus infinita, infinitis excogitat modis.

12. De Reminiscentia et de Reflexione Mentis in se Ipsum

Nuper incidi in tract. Nic. Oregii de animi immortalitate secundum Aristotelem, inscriptum Urbano VIII. Ipsum Papam adhuc Cardinalem sibi eius fuisse hortatorem. Ait Aristoteli aliud esse intellectum passivum, id enim esse phantasiam, aliud vero esse intellectum possibilem, qui recipiat
516 species intellectibiles immateriales. Intellectum agentem non esse Deum Aristoteli. Aristotelem sensisse, quod intellectus separatus non reminiscatur, quoniam reminiscentia non sit sine imaginatione. Equidem mihi videtur esse aliquam per se reminiscentiam nostri, et perceptionis. Sed non variae perceptionis. Adeoque nec erit voluptas nec dolor, sine imaginibus. Neque enim haec sine reminiscentia. Ne Deus quidem haberet voluptatem nisi varias creaturas perciperet, quae ipsi sunt imaginum loco. Deus est Mens perfecta, eaque suarum ipsa perceptionum causa est. Quod non est in mente alia qualibet. Videtur mihi sine reminiscentia nihil ad nos

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12. De Reminiscentia et de Reflexione Mentis in se Ipsum

Nuper incidi in tract. Nic. Oregii de animi immortalitate secundum Aristotelem, inscriptum Urbano VIII. Ipsum Papam adhuc Cardinalem sibi eius fuisse hortatorem. Ait Aristoteli aliud esse intellectum passivum, id enim esse phantasiam, aliud vero esse intellectum possibilem, qui recipiat
516 species intellectibiles immateriales. Intellectum agentem non esse Deum Aristoteli. Aristotelem sensisse, quod intellectus separatus non reminiscatur, quoniam reminiscentia non sit sine imaginatione. Equidem mihi videtur esse aliquam per se reminiscentiam nostri, et perceptionis. Sed non variae perceptionis. Adeoque nec erit voluptas nec dolor, sine imaginibus. Neque enim haec sine reminiscentia. Ne Deus quidem haberet voluptatem nisi varias creaturas perciperet, quae ipsi sunt imaginum loco. Deus est Mens perfecta, eaque suarum ipsa perceptionum causa est. Quod non est in mente alia qualibet. Videtur mihi sine reminiscentia nihil ad nos

whole nature of God, since it involves the whole series of things of that sort. But an infinite series results only from infinite attributes. But when all other things are related to any attribute, there result modifications in that attribute; hence it comes about that the same essence of God is expressed in any genus of the world in its totality, and so God manifests himself in infinitely many ways.

No cause can be understood of whatever is conceived through itself. For an effect is conceived through its cause, from which it is evident that, if something exists through itself, and also if other things exist, then it exists. The correct way of considering the matter is that forms are conceived through themselves; subjects, and the fact that they are subjects, are
515 conceived through forms. But that whose modifications depend on the attributes of another, in which all its requisites are contained, is conceived through another. That is, it cannot be perfectly understood unless the other is understood. Those things are connected of which the one cannot be understood without the other. Requisites are those things which are connected with another, but not conversely. A reason is a sum of requisites.[5] Sensible things cannot be understood perfectly by us, since infinitely many things concur in their constitution, because of the fact that time and place are divisible to infinity. Hence the perception of a sensible quality is not one perception, but an aggregate of infinitely many perceptions.

God thinks out infinitely many things in infinitely many ways.

12. On Reminiscence and on the Mind's Self-reflection

A, No. 73

Second half ? of April 1676[1]

515 I recently came across the treatise of Nicolas Oregius[2] on the immortality of the soul according to Aristotle, dedicated to Urban VIII. At that time the pope[3] was still a cardinal, and encouraged the author. Oregius says that for Aristotle the passive intellect is one thing, since it is the imagination, but that the possible intellect, which receives intelligible immaterial
516 species, is another. He says that for Aristotle, the active intellect is not God, and that Aristotle had sensed that the separated intellect does not remember, since there is no memory without imagination. To me, it seems that there is some memory *per se* of ourselves and of perception, but not of varied perception. And so there will be neither pleasure nor pain without images; for pleasure and pain do not exist without memory.[4] Not even God would have pleasure unless he perceived various creatures, which for him take the place of images. God is the perfect mind, and that mind is the cause of its own perceptions; which is not the case with any other mind.[5] It seems to me that, without memory, what happens after death would not

pertinere quae fient post mortem. Itaque reminiscentia erit aliqua post mortem, qualis in obdormiscente.

Operatio mentis maxime mira mihi illa videtur, cum cogito me cogitare, et inter cogitandum, hoc ipsum jam noto, quod de cogitatione mea cogitem, et paulo post miror hanc triplicationem reflexionis: mox et me mirari adverto, et nescio quomodo miror ipsam admirationem, obtutuque defixus in uno, velut per vicem magis magisque in me redeo, et saepe cogitationes ipse meas animum elevo. Hoc ut fiat necesse est quadam etiam nervorum contentione ut aliarum extranearum perceptionum vis et vivacitas debilitetur et frangatur. Unde fit ut lassemur denique hac contentione, et dolorem capitis sentiamus, aut etiam si forte pergeremus, possimus mente alienari, saepe autem hanc animi operationem nec si velimus excitare possumus, quando scilicet incipimus subdubitare an possimus, et de obstaculis cogitamus variasque perceptiones extraneas velut experiendae difficultatis causa nasci facimus, prorsus quemadmodum non possumus obdormiscere, quoties de dormiendi difficultate cogitamus. Caeterum ubi semel in istam animi in se reductionem recepti sumus, fit nonnunquam, ut aliquandiu continuemus, ac vix aegre ac vi quadam denique revocemur ad externa. Uti mihi aliquando contigit, ut non possem cuiusdam rei oblivisci, et pene hora integra idem cogitarem invitus dum scilicet cogitabam de hac ipsa cogitationis difficultate, perpetuisque in reflexiones reflexionibus ipse me obtunderem. Ut pene inciperem dubitare an unquam aliud essem cogitaturus, jamque subvererer ne mihi noceret ista animi intentio. Haec autem quo magis agitabam, eo minus ejicere animo poteram caeterum durantibus eiusmodi reflexionibus. Si quis horum experientiam desideret, tantum aliquando in tenebris noctu,
517 cum forte dormire nequit, incipiat de se et cogitatione sua, et perceptione perceptionum cogitare, et hunc ipsum sui statum admirari, et quasi diversis animi ictibus per vices magis magisque intra se, aut supra se ire; mirabitur ipse hunc nondum sibi forte expertum mentis statum. Porro nunquam sine aliis sensuum perceptionibus sumus, sentimus enim intra nos hanc animi intentionem, qua intra nos reducimur; et externa supprimimus. Et certe fatigatio quae puras intellectiones comitatur saepe hinc oritur. Porro animadverti hanc perceptionem perceptionis contingere etiam sine characteribus. Atque adeo et memoriam, percipere enim perceptionem seu sentire se sensisse est meminisse, ut ait Hobbes. Nondum satis explico, quomodo fiant illi ictus animi diversi, in illa semper re-

matter to us.[6] So there will be some memory after death, as there is in someone who falls asleep.

The following operation of the mind seems to me to be most wonderful: namely, when I think that I am thinking, and in the middle of my thinking I note that I am thinking about my thinking, and a little later I wonder at this tripling of reflection. Next I also notice that I am wondering and in some way I wonder at this wonder, and fixed in one contemplation I return more and more into myself, alternately as it were, and often elevate my mind through my thoughts.[7] For this to come about it is necessary that the power and vivacity of other extraneous perceptions shall be weakened and broken by some effort of the nerves. So it comes about that we are finally wearied by this effort and feel a headache, or we can even (if we persist) become insane. But often we cannot excite this operation of the mind even if we wish; this happens when we begin to doubt if we can, and we think of obstacles and cause the occurrence of various extraneous perceptions, as it were for the sake of experiencing difficulty—just as we cannot sleep as long as we think of the difficulty of sleeping. However, once we have undergone this bringing back of the mind into itself, it sometimes happens that we continue in it for some time, and it is only with difficulty, and with a kind of force, that we are finally brought back to external things. This has happened to me sometimes, as when I cannot forget a certain thing, and have thought unwillingly of the same thing for about a whole hour—that is, whilst I was thinking of the very difficulty of this thought, and was wearying myself with perpetual reflections on reflections. The result was that I almost began to doubt if I should ever think of anything else, and was rather afraid that this intention of the mind might harm me. But the more I considered these things, the less I could cast them out of my mind whilst reflections of this kind continued. If anyone wants to experience these things, then all he has to do is this: at some time in the darkness of the
517 night, when it happens that he cannot sleep, let him begin to think of himself and of his thinking and of the perception of perceptions, and begin to wonder at this state of his, and—as it were by different alternate beats of the mind—go more and more within himself, or above himself; then he will wonder that he has not experienced this state of mind previously. Further, we are never without other perceptions of our senses; for we sense within ourselves this intention of the mind, by which we are brought back within ourselves and suppress what is external. Certainly, the fatigue which accompanies acts of pure thought often arises from this. Further, I have noticed that this perception of perceptions also occurs without symbols. And so, therefore, does memory; for as Hobbes says,[8] to perceive a perception, or to sense that one has sensed, is to remember. I have not yet explained satisfactorily how there come about these different beats of the

ciprocata reflexione, eorumque ictuum velut intervalla. Sed illi videntur fieri a sensu intentionis corporeae distinguente; sed si bene observes ille ictus facit tantum ut memineris, te paulo ante jam hoc ipsum in animo habuisse, reflexionem scilicet reflexionis, eamque velut observes, et distincta imagine comitante designes. Iam ante ergo erat, ideoque perceptio perceptionis in infinitum est perpetuo in anima, inque ea consistit eius per se existentia, et continuationis necessitas.

13. De Origine Rerum Ex Formis

518 *Idea* est differentia cogitationum ratione objecti. Non potest negari ipsas cogitationes ratione objectorum differre; adeoque in ipsis cogitationibus aliquam esse modificationem, adeoque modificationem non esse tantum in composito ex cogitante et extenso. Est ergo verum recteque dici potest Modificationem esse in cogitatione. Eodem modo spatii portiones sunt, sive loca sunt extensa modificata, et figurae in spatio sunt modificationes in extensione, ut sensiones sunt modificationes in mente. Verum quidem est non posse existere ullas neque in spatio neque in Mente modificationes, nisi ope materiae, cuius naturae utrumque conjungere est; data tamen materia, in ipsa postea mente, inque ipso extenso existunt modificationes, et differunt haec, ut actio a passione, paternitas a filiatione.

An Mens sit idea corporis? hoc fieri non potest, quia corpore continuo mutato mens manet. Et cuius corporis idea erit, an totius illius quod percipit; ergo quaelibet mens erit idea totius vorticis, quod utique non est, nisi dicas esse resultationem ex relatione caeterorum omnium ad certum quoddam.

Extensio est status, cogitatio actio. Extensio est quiddam absolutum. Cogitatio relativum. Omne cogitans cogitat utique aliquid. Simplicissimum est, id quod cogitat cogitare se ipsum; et cogitatio absoluta est, cum id quod cogitat se ipsum, omnia est.

Plura a nobis percipiuntur in Mente nostra, ut: cogitare seu percipere, percipere se ipsum, percipere se esse eundem; percipere voluptatem et dolorem. Percipere tempus seu durationem. Voluptas videtur venire ex plurium cogitatione, seu transitu ad perfectionem. Felicitas ipsa consistit, in non impedito continuo transitu ad majorem perfectionem. Cum in nobis

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mind, with that constantly reciprocated reflection, and, as it were, the intervals of these beats. They seem to occur by the distinguishing awareness of the corporeal intention; but, if you observe carefully, that beat only brings it about that you remember that you had this—namely, the reflection of a reflection—in the mind a little before, and you, as it were, observe this, and designate it by a distinct image which accompanies it. Therefore it already existed before, and so the perception of a perception to infinity is perpetually in the mind, and in that there consists its existence *per se*, and the necessity of the continuation.

13. On the Origin of Things from Forms

A, No. 74

April ? 1676[1]

518 An *idea* is a differentia of thoughts in respect of an object.[2] It cannot be denied that thoughts themselves differ in respect of objects; so in thoughts themselves there is some modification, and so a modification does not exist only in that which is composed of that which thinks and that which is extended. So it is true, and can be said correctly, that there is a modification in thought. In the same way there are portions of space, or, places are extended things that are modified, and shapes in space are modifications in extension, just as sensations are modifications in the mind. However, it is true that there cannot exist any modifications, either in space or in the mind, except with the help of matter, whose nature it is to combine the two. But matter being given, then there exist modifications in the mind and in that which is extended, and these differ as action from passion, and as being a father from being a son.

Is the mind the idea of the body?[3] That cannot be, for the mind remains when the body has been continually changed. And will the idea of the body be the idea of all that it perceives? If so, any mind will be the idea of a whole vortex, which is not the case—unless you say that it is the result of the relation of all other things to one certain thing.

Extension is a state, thinking is an action. Extension is something absolute, thinking is relative. Everything that thinks, thinks something.[4] The most simple thing is that that which thinks that it thinks itself; and thinking is absolute when that which thinks itself is all things.

We perceive many things in our mind, such as thinking or perceiving, perceiving oneself, perceiving oneself to be the same, perceiving pleasure and pain, perceiving time or duration. Pleasure seems to come from thinking of many things, or, from the transition to perfection. Happiness itself consists in an unimpeded continual transition to a greater perfection.

nil sit nisi Mens, mirum est quomodo in ea tam diversa percipiantur. Sed revera addita ipsa est Materiae, et sine materia non ita perciperet. Mirum quomodo Natura materiae et Mentis faciat, ut certae quaedam dispositiones faciant in mente nostra sensum, quem vocant luminis, rubedinis, aliosque. Micatio videtur quodammodo oriri a pluribus ictibus repetitis, unde et digitis micare.

Idea existentiae, et identitatis, a corpore non venit, nec unitatis; mira res, cum mens meminit negativorum, seu conscia est, se aliquid non cogitasse.

Mihi videtur origo rerum ex Deo talis esse, qualis origo proprietatum ex essentia, ut senarius est 1 + 1 + 1 + 1 + 1 + 1. Ergo 6 ⊓ 3 + 3, ⊓ 3 ⌒ 2,
519 ⊓ 4 + 2, etc. Nec dubitandum est unam expressionem ab alia differre, nam uno modo ternarium expresse cogitamus, aut binarium, alio non idem, certum est autem ternarium ab eo non cogitari, qui sex Unitates simul cogitat; cogitaretur, si tribus cogitatis limitem statueret. Multo minus de multiplicatione cogitat, qui sex unitates cogitat simul. Ut ergo differunt hae proprietates, inter se et ab essentia, ita et differunt res inter se et a Deo. Voce rei lubenter utor, nam solemus dicere Deus est Ens, non solemus dicere Deus est res.

Mens nostra differt a Deo, ut Extensum absolutum, quod maximum, et indivisibile est a spatio, seu loco; sive ut ipsum per se extensum, a loco. Spatium totus locus est. Spatii sunt partes, ipsius extensi per se nullae sunt partes; sed aliqui sunt eius modi. Spatium eo ipso quia in partes dissecatur, mutabile est, et varie dissecatur; imo continue aliud atque aliud est, at basis spatii, ipsum per se extensum, indivisibile est, manetque durantibus mutationibus, neque immutatur, quia omnia penetrat. Non ergo locus est eius pars, sed eius modificatio, ex accedente materia, seu aliquid ex ipsa et materia resultans. Eodem plane modo Mens divina est ad nostram, ut spatium quod vocant imaginarium (cum sit maxime reale, est enim ipse Deus, quatenus consideratur ubique seu immensus) est ad locum, et varias in ipso immenso natas figuras. Perplacet itaque, ut hoc ut a spatio distinguam, vocem ipsum *Immensum*. Immensum itaque est, quod in continua spatii mutatione perstat, hoc ergo terminos nec habet nec habere potest, estque unum et indivisibile. Posses et appellare ipsum Expansum.

Since there is nothing in us except the mind, it is wonderful how so many different things are perceived in it. But in fact the mind is added to matter, and without matter it would not perceive as it does. It is wonderful how the nature of matter and of the mind brings it about that certain dispositions produce in our mind the sensation which is called that of light, of redness, and other sensations. Flickering seems in some way to arise from many repeated blows, as in flicking one's fingers.[5]

The idea of existence and of identity does not come from the body, nor does that of unity. It is a wonderful thing when the mind remembers negatives, or, is conscious that it has not thought something.

It seems to me that the origin of things from God is of the same kind as the origin of properties from an essence; just as $6 = 1 + 1 + 1 + 1 + 1 + 1$, therefore $6 = 3 + 3$, $= 3 \times 2$, $= 4 + 2$, etc. Nor may one doubt that the
519 one expression differs from the other, for in one way we think of the number 3 or the number 2 expressly, and in another way we do not; but it is certain that the number 3 is not thought of by someone who thinks of six units at the same time. It would be thought of, if the person were to impose a limit after three had been thought. Much less does someone who thinks of six units at the same time think of multiplication. So just as these properties differ from each other and from essence, so do things differ from each other and from God. I use the word "thing" readily, for we are accustomed to say, "God is a being," but we are not accustomed to say, "God is a thing."

Our mind differs from God as absolute extension,[6] which is a maximum and is indivisible, differs from space, or place; or, as that which is extended *per se* differs from place. Space is the entirety of place. There are parts of space, but there are no parts of that which is extended *per se;* however, there are some modes of it. Space, by the very fact that it is divided into parts, is changeable, and is divided in various ways; or rather, it is continually one thing and another thing. But the basis of space, that which is extended *per se,* is indivisible, and remains whilst changes last; it is not changed, since it penetrates all things. So place is not a part of it but is a modification of it, as a result of the addition of matter; or, it is something that results from the basis of space[7] and from matter. Clearly, in the same way, the divine mind is to our mind as what is called imaginary space[8] (for that space is supremely real, since it is God himself in so far as he is considered to be everywhere, or, is immeasurable)[9] is to place, and to the various shapes that arise in the immeasurable. So in order to distinguish this from space I think it best to call it "the immeasurable." So it is the immeasurable which persists during continuous change of space; it therefore neither has nor can have limits, and is one and indivisible. You

Satis ex his patet ipsum hoc immensum non esse intervallum, nec esse locum, nec esse mutabile, modificationes autem fieri nulla eius mutatione, sed superadditione alterius, nempe Molis, sive Massae; ex additione molis et massae resultant spatia, loca, intervalla, quorum aggregata dant Spatium Universum, sed hoc spatium universum est Ens per aggregationem continue variabile; compositum scilicet ex spatiis vacuis plenis, ut rete, quod rete continuo aliam accipit formam, adeoque mutatur; sed quod in illa mutatione perstat, est ipsum immensum. Ipsum autem immensum est Deus quatenus cogitatur esse ubique, seu quatenus eam perfectionem, sive formam absolutam affirmativam quae tribuitur rebus, quando dicitur eas esse alicubi, continet.

Deus est subjectum omnium formarum absolutarum simplicium, absolutarum id est affirmativarum. Iam ergo in Deo duo, id quod Unum est in
520 omnibus formis, et Essentia seu collectio formarum. Scilicet unus idemque Deus est absolute ubicatus, seu omnipraesens; et absolute durans, id est aeternus; et absolute agens, id est omnipotens, et absolute existens, sive perfectus. Esse est quemadmodum cogitare, cum relatione ad aliquid. Nemo est, nisi sit aliquid. Cui existentia tribuitur, absolute, id est, existentia sine additione determinante, ei tribuitur existentia, quanta tribui potest, id est maxima.

Non potest dari Motus celerrimus, nec Numerus maximus, nam numerus est quiddam discretum, ubi non totum prius partibus sed contra. Motus celerrimus, esse non potest, quia motus est modificatio. Estque certae rei translatio; in certo tempore. Prorsus quemadmodum figura maxima dari non potest. Non potest unus motus esse totius; at potest cogitatio quaedam esse omnium. Quandocunque Totum prius partibus, tunc maximum est, ut in spatio, in continuo. Si materia est quemadmodum figura, id quod facit modificationem, tunc videtur nec materiae quoddam esse totum.

Uti spatium est ad Immensum, ita collectio omnium Mentium est ad intellectum agentem. Deus est intelligentia prima, quatenus est omniscius, seu quatenus eam continet formam absolutam affirmativam, quae limitate tribuitur aliis quae aliquid percipere dicuntur. Quemadmodum Deus est ipsum Immensum, quatenus perfectio ei tribuitur id est forma

could also call it "the expanded." It is sufficiently clear from this that the immeasurable is not an interval, nor is it a place, nor is it mutable. Its modifications occur without any change in it, but with the addition of something else, namely bulk or mass; from the addition of bulk and mass there result spaces, places, and intervals, whose aggregates give universal space. This universal space is an entity by aggregation, which is continually variable; it is composed of spaces which are empty and full, like a net, and this net continually receives a new form, and so is changed. What remains in that change is the immeasurable itself. But the immeasurable itself is God, in so far as he is thought to be everywhere; or, in so far as he contains that perfection, or absolute affirmative form,[10] which is ascribed to things when they are said to be somewhere.

God is the subject of all absolute simple forms—absolute, that is, affirmative. So there are already in God these two: that which is one in all
520 forms, and essence, or, a collection of forms.[11] That is to say, God, who is one and the same, is absolutely ubiquitous, or omnipresent; he is absolutely enduring, i.e., eternal; he is absolutely active, i.e., omnipotent; and he is absolutely existent, or, perfect. To exist is, as it were, to think, with relation to something. No one exists, without being something. That to which existence is ascribed absolutely, i.e., existence without some determining addition, has ascribed to it as much existence as can be ascribed, i.e., the greatest existence.

There cannot be a most rapid motion or a greatest number. For number is something discrete, where the whole is not prior to its parts, but conversely. There cannot be a most rapid motion, because motion is a modification, and is the transference of a certain thing in a certain time. (Just as there cannot be a greatest shape.) There cannot be one motion of the whole, but there can be a kind of thinking of all things.[12] Whenever the whole is prior to its parts, then it is a maximum, as in space and in a continuum. If matter is like shape, namely that which makes a modification, then it seems that there is no totality of matter.

Just as space is to the immeasurable, so is the collection of all minds to the active intellect. God is the primary intelligence, in so far as he is omniscient, or, in so far as he contains the absolute affirmative form which is ascribed in a limited way to other things which are said to perceive something. In the same way, God is the immeasurable itself, in so far as there is ascribed to him a perfection—that is, an absolute affirmative

affirmativa absoluta quae invenitur in rebus, cum tribuitur ipsis esse alicubi, esse praesentes.*

Deus non est pars Mentis nostrae, quemadmodum nec immensum pars est loci cuiusdam sive intervalli. Ut Deus est id quod perfecte percipit,
521 quicquid percipi potest, sive intelligentia, ita idem Deus est id quod perfecte alicubi est, ubicunque aliquid esse potest. Ut ergo Deus est intelligentia, ita idem Deus est ipsum immensum. Porro Spatium Universale tam est Ens per aggregationem, quam Respublica universalis, sive Societas omnium Mentium. In eo uno differentia est, quod Locus sive intervallum destruitur, sublato enim locato tollitur locus, at Anima quae illi proportione respondet, destrui non potest. Quicquid agit, illud destrui non potest, saltem enim durat dum agit, ergo durabit semper. Quicquid patitur neque agit, id destrui potest, ut locus, figura. Corpus omne aggregatum destrui potest. Videntur esse Elementa sive corpora indestruibilia, quia scilicet Mens in illis. Ut figura jam est in Immenso, antequam designetur, ita idea sive differentia cogitationum jam est in Intelligentia prima. Ut figura est in spatio; ita scilicet idea in mente nostra. Anima Mundi nulla est, quia non potest continuum quoddam componi ex mentibus, ut ex spatiis componi potest. Dices imo certo etiam modo, quatenus sese sentiunt. Respondeo et dico Animam non esse ens per aggregationem, Spatium autem universum esse Ens per aggregationem. Unde mirum non est nullam esse Animam universi.

Nulla est Idea Universi, quemadmodum figura quoque eius nulla est. Ideae sunt in mente nostra, differentiae scilicet cogitationum. Ideae sunt in Deo, quatenus ex formarum omnium absolutarum sive perfectionum possibilium conjunctione in eodem subjecto fit Ens perfectissimum; ex conjunctione autem formarum simplicium possibilium resultant modificationes, id est ideae, ut ex essentia proprietates. Infinitae sunt formae simplices, quia perceptiones nostrae infinitae, nec ex se invicem explicabiles; ut ex sola perceptionis et extensionis cognitione non possunt explicari quae sentimus in rubro, luminoso, calido, neque unquam id possibile

*Here, Leibniz has appended the following table:

Communia: Deus. Forma, absolutum, affirmativum, perfectio. Mutatio. Modificatio.

Ad *Cogitationem* pertinentia: Mens. Intelligentia prima. Anima. Respublica Universalis. Idea. Cogitatio.

Ad *Extensionem* pertinentia: Extensum. Immensum. Locus. Spatium universale. Figura. Motus

form—which is found in things when there is ascribed to them being somewhere, or being present.*

God is not a part of our mind, just as the immeasurable is not a part of some place or interval. Just as God is that which perceives perfectly
521 whatever can be perceived, or, is an intelligence, so God is that which is perfectly somewhere, wherever something can be. So just as God is an intelligence, so God is the immeasurable itself. Further, universal space is just as much an entity by aggregation as is the universal republic, or the society of all minds. The difference lies in this one thing: that a place or interval is destroyed—for when that which has a place is destroyed, the place is destroyed—but the soul which corresponds to it in proportion cannot be destroyed. Whatever acts cannot be destroyed; for at least it endures whilst it acts, therefore it will endure for ever. Whatever suffers and does not act, such as place and space, can be destroyed. Every body which is an aggregate can be destroyed. There seem to be elements, i.e., indestructible bodies, because there is a mind in them. Just as there is already a shape in the immeasurable before it is marked out, so there is already an idea, i.e., a differentia of thoughts,[13] in the primary intelligence. Just as a shape is in space, so is an idea in our mind. There is no soul of the world, because a continuum cannot be composed of minds, as it can be composed of spaces. You will say that such a soul does exist in a certain way, in so far as minds sense themselves. I say in reply that a soul cannot be an entity by aggregation, but that universal space is an entity by aggregation. So it is not surprising that there is no soul of the universe.

There is no idea of the universe, just as there is no shape of the universe. Ideas exist in our minds, namely as the differentiae of thoughts. Ideas exist in God in so far as the most perfect being arises out of the conjunction in the same subject of all possible absolute forms or perfections; but from the conjunction of simple possible forms there result modifications, that is, ideas, as properties result from an essence. There are infinitely many simple forms because our perceptions are infinitely many, and are not explicable in terms of each other; just as from the mere knowledge of perception and extension one cannot explain what we sense in red, the luminous, or the hot, nor is it ever possible for that to be done, not even

*Here, Leibniz has appended the following table:
Common terms: God. Form, absolute, affirmative, perfection. Change. Modification.
Belonging to *thought:* Mind. Primary intelligence. Soul. Universal republic. Idea. Thought.
Belonging to *extension:* The extended. The immeasurable. Place. Universal space. Shape. Motion.

est fieri, ne tunc quidem, cum. In nobis Voluptas est sensus augmenti perfectionis, in Deo est ipsa perfectio tota semel possessa. Cuius sensum aliquem seu perceptionem in Deo esse necesse est; adeoque et Voluptatem. Ipsum universum continue crescitne in perfectione, an ejusdem
522 manet perfectionis, an diminuitur? Videtur Mentium augeri semper perfectio in summa, corporum non augeri, frustra enim augeretur, atque haec vera est ratio a priori, cur eaedem semper maneant vires. Eadem semper potentia, non eadem semper scientia nostra.

14. De Formis Simplicibus

April. 1676

522 Formae simplices: perceptio, situs. At Mutatio et Materia, sive ipsae Modificationes sunt resultantia ex omnibus aliis Formis simul sumtis. Sunt enim infinite varia in materia et motu. Quae varietas infinita, non nisi ex causa infinita, id est variis formis, oriri potest. Unde facile intelligitur formas simplices esse infinitas. Modificationes autem ex omnibus resultantes, relatae ad singulas, constituunt in illis varietatem. Videtur perceptio et situs esse ubique, at materia esse in aliis atque aliis diversa, adeoque aliae atque aliae oriri leges; ut si in nostro sit Lex, ut eadem semper servetur quantitas motus. Potest alia esse rerum natura, in qua etiam aliae leges. Sed tamen necesse est, hoc spatium differre ab illo, erit scilicet positio quaedam, et multitudo, sed non erit necesse ut sit longitudo, latitudo et profunditas. Videmus jam in tempore, in angulo, aliisque varia
523 esse genera quantitatum. Ubique videtur esse perceptio, voluptas, felicitas, eius enim haec est natura mira, ut duplicet imo in infinitum multiplicet rerum varietatem. Sed diversitas videtur aliis modis posse fieri. Quae scilicet in nostram mentem non cadunt. Varietas eadem in quolibet genere mundi, nec est quicquam aliud, quam eadem essentia diversimode relata, ut si urbem eandem ex diversis locis aspicias, aut si essentiam senarii referas ad ternarium, erit $3 \frown 2$ vel $3 + 2$, sin ad quaternarium erit $^6/_4 \sqcap {}^3/_2$ seu $6 \sqcap 4 \frown {}^3/_2$. Unde mirum non est, produci quodammodo diversa.

Cum Mens aliquid percipit in Materia, negari non potest, dum alia atque alia percipit, etiam in ipsa esse mutationem. Dum alius fit me major, crescendo, utique in me quoque aliqua accidit mutatio, cum mutata sit

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when. . . .[14] In us, pleasure is the sense of an increase in perfection; in God it is perfection in its entirety, possessed once for all. It is necessary that there is some sense or perception of this in God, and so pleasure also exists in God. Does the universe itself continually increase in perfection, or does its perfection remain the same, or is it diminished? It seems that
522 the sum of the perfection of minds is always increased, but that of bodies is not. For an increase would be pointless, and this is the true *a priori* reason[15] why forces always remain the same. There is always the same power, but our knowledge is not always the same.

14. On Simple Forms

A, No. 75

April 1676[1]

522 Perception and situation are simple forms. But change and matter, i.e., modifications, are what result from all other forms taken together. For there are infinitely various things in matter and in motion, and this infinite variety can result only from an infinite cause, that is, from various forms. From this it is easily understood that simple forms are infinitely many. But the modifications which result from them all, related to individual forms, constitute the variety in them. It seems that perception and situation are everywhere, but matter is different in various things, and so various laws arise. For example, if it is a law in our world that the same quantity of motion is always preserved, there can be another universe in which there are also other laws. But it is necessary that the latter space differs from the former; there will be position of some kind, and multitude, but it will not be necessary that there should be length, breadth, and depth. We see already that there are various kinds of quantities in time, in an angle, and
523 in other things. It seems that perception, pleasure, and happiness are everywhere; for it is the wonderful nature of this[2] that it duplicates—indeed, it multiples to infinity—the variety of things. But it seems that variety can come about in other ways, which do not come within the reach of our mind. There is the same variety in any kind of world, and this is nothing other than the same essence related in various ways, as if you were to look at the same town from various places; or, if you relate the essence of the number 6 to the number 3, it will be 3×2 or $3 + 3$,[3] but if you relate it to the number 4 it will be $^6/_4 = {}^3/_2$, or $6 = 4 \times {}^3/_2$. So it is not surprising that, in a certain way, different things are produced.

It is undeniable that, when the mind perceives something in matter, whilst it perceives various things there is also a change in it. When someone, by growing, becomes bigger than me, then some change occurs in me

denominatio de me. Et hoc modo omnia in omnibus quodammodo continentur. Sed alia plane ratione in Deo, quam in Rebus, et in Rerum generibus, seu Mundis quam in singulis. Fiunt autem res non ex sola combinatione, formarum, in Deo, sed et cum subjecto. Subjectum ipsum seu Deus cum sua ubiquitate dat immensum, hoc immensum combinatum cum aliis subjectis, facit sequi Modos omnes possibiles, seu Res in ipso. Varia resultantia ex formis combinata cum subjecto, faciunt resultare particularia. Quomodo res resultent ex formis, non aliter quam similitudine Numerorum ex unitatibus possum explicare, hoc adhuc discrimine, quod unitates omnes homogeneae, formae vero sunt differentes.

15. De Plenitudine Mundi

1676

524 Mihi videtur Omnem mentem esse omnisciam, confuse. Et quamlibet Mentem simul percipere quicquid fit in toto mundo; et has confusas infinitarum simul varietatum perceptiones dare sensiones illas quas de coloribus, gustibus, tactibusque habemus. Tales enim perceptiones non uno constant actu intellectus, sed aggregato infinitorum; praesertim cum ad sensum alicuius coloris alteriusve rei perceptibilis, sit opus quodam temporis tractu. Tempus autem in infinitum divisibile, et certum est quolibet momento percipere animam, alia atque alia, sed ex omnibus perceptionibus infinitis in unum confusis oriri rerum sensibilium perceptiones. Sed existentiae, cogitationis ipsius, aliorumque id genus perceptio fit momento. Porro mirum non est quandam mentem percipere quae aguntur in toto mundo, quia nullum est corpus tam exiguum, quin posita Mundi plenitudine alia omnia sentiat. Itaque hoc modo mira oritur varietas, quot enim mentes, tot diversae universi relationes; quemadmodum si urbs eadem e diversis locis spectetur, itaque plurium Mentium creatione Deus efficere voluit de universo, quod pictor aliquis de magna urbe, qui varias eius species sive projectiones delineatas exhibere vellet, pictor in tabula, ut Deus in mente.

Ego magis magisque persuasus sum de corporibus insecabilibus, quae cum non sint orta per motum, ideo simplicissima esse debent ac proinde sphaerica, omnes enim aliae figurae subjectae varietati. Non ergo videtur

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as well, since a denomination of mine is changed.[4] In this way, all things are in a way contained in all things. But they are contained in a quite different way in God from that in which they are contained in things; and in the genera of things, i.e., in worlds, from that in which they are contained in individuals. Things are not produced by the mere combination of forms in God, but along with a subject also. The subject itself, or God, together with his ubiquity, gives the immeasurable, and this immeasurable combined with other subjects brings it about that all possible modes, or things, follow in it. The various results of forms, combined with a subject, bring it about that particulars result. I cannot explain how things result from forms other than by analogy with the way in which numbers result from units—with this difference, that all units are homogeneous, but forms are different.

15. On the Plenitude of the World

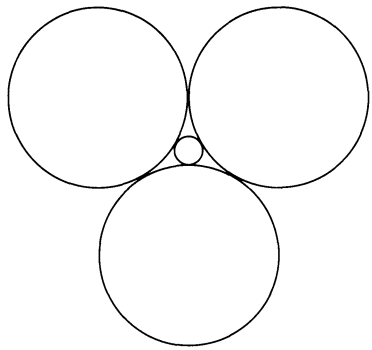
A, No. 76

Early ? 1676[1]

524 It seems to me that every mind is omniscient in a confused way; that any mind perceives simultaneously whatever happens in the entire world, and that these confused perceptions of infinite simultaneous varieties produce the sensations that we have of colors, tastes, and feels.[2] For such perceptions consist, not in one act of the intellect, but in an aggregate of infinitely many acts, especially when some period of time is needed for the sensation of some colour or other perceptible thing. But time is infinitely divisible, and it is certain that at any moment the soul perceives various things, but from all these infinitely many perceptions confused into one there arise the perceptions of sensible things. But the perception of existence, of thought itself, and of other things of that kind takes place in a moment. Again, it is not surprising that any mind should perceive what is done in the entire world, since there is no body that is too small to sense all other things, given the plenitude of the world. And so a wonderful variety arises in this way, for there are as many different relations of things as there are minds, just as when the same town is seen from various places.[3] So God, by the creation of many minds, willed to bring about with respect to the universe what is willed with respect to a large town by a painter, who wants to display delineations of its various aspects or projections. The painter does on canvas what God does in the mind.

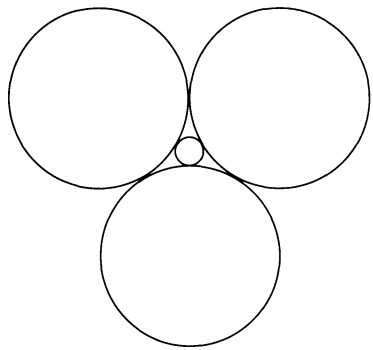
I am more and more persuaded that unsplittable[4] bodies, since they have not arisen through motion, must be most simple and therefore spherical; for all other shapes are subject to variety. So it seems indubitable that

525 dubitandum esse Atomos sphaericas infinitas. Si nullae essent Atomi omnia dissolverentur posito pleno. Rationale est plenum mirabile quale explico, quanquam meris ex sphaeris. Nullus enim locus est tam parvus quin fingi possit esse in eo sphaeram ipso minorem. Ponamus hoc ita esse,



nullus erit locus assignabilis vacuus. Et tamen Mundus erit plenus, unde intelligitur quantitatem inassignabilem esse aliquid. Diversi resistentiae gradus non possunt esse in primis et simplicissimis, explicanda enim causa varietatis. Est tamen ubi demonstrari potest varietas, ut globorum, nam posita plenitudine Mundi, necesse est globulos esse alios aliis minores in infinitum. Videndum an globulis tribuendus motus circa proprium centrum. Ex globulis solis explicari potest connexio corporum, sine ullis hamis, uncisque, qui inepti et a rerum simplicitate et pulcritudine alieni. Causa autem connexionis, cum pilae majores separari non possunt facile quin motum mediocrium circumfusarum turbent, quae in earum locum succedere non possunt, ob interstitia non satis magna, inter globos majores, ita fit, ut globi valde parvi tantum transire possint, mediocrium vero circumfusorum turbetur motus, et omnia quasi removeantur, totaque horum mediocrium atmosphaera elevetur, quod non fieret si mediocria circumfusa in locum majorum se separantium succedere et inter eorum loca vacua transire possent. An difficilis explicationis, unde oriatur gyratio corporum mundanorum circa sua centra? nisi putemus id fieri ut in turbine quem pueri impellunt aliisque, omnia scilicet talia a caeteris non moveri tantum, sed et rotari. Mirum vero unde fiant periodi translatae, in motu circa suum centrum.

525 there exist infinite spherical atoms. If there were no atoms, then, given a plenum, all things would be dissolved.[5] A wonderful plenum of the kind that I expound is rational, even though it consists of nothing but spheres. For there is no place so small that there cannot be assumed to exist in it a sphere which is less than it. Assuming that things are so, there will be no



assignable place that is empty. Yet the world will be full, from which it is understood that an assignable quantity exists.[6] There cannot be different degrees of resistance in the primary and most simple bodies, for the cause of the variety must be explained.[7] However, there is a case in which variety can be demonstrated, namely the variety of the globes; for granted the plenitude of the world it is necessary that there are globules smaller than others, and so on to infinity. One must see if motion round their own centre is ascribable to globules. One can explain the connection of bodies by means of globules alone, without any hooks or barbs,[8] which are both inept and inconsistent with the simplicity and beauty of things.[9] But the cause of connection is this: since larger globes cannot be separated easily without disturbing the motion of the middle-sized globes which surround them, and which cannot come to occupy the place of the larger globes because the gaps between the larger globes are not big enough, it happens that only very small globes can pass through, but that the movement of the middle-sized globes is disturbed, and all things are as it were dispersed, and the whole atmosphere of these middle-sized globes is lessened;[10] which would not occur if the surrounding middle-sized bodies could come to occupy the place of the larger bodies which separate them and could pass between their empty places. Is it difficult to explain the origin of the gyration of mundane bodies[11] around their centers? Perhaps we should think that this gyration is like that of a top which boys whip, and other things of this sort; namely, what happens is that all such things are not only moved by the others, but also rotated. But it is wonderful how transferred movements in a circle come about in motion around a thing's own center.

Quot sunt corpora insecabilia, tot sunt vortices, seu motus circumsectorum relatione ad unum quoddam variati. Discrimen est tamen inter corpus insecabile quietum per se, et motum tantum motu aliorum et inter id quod sponte sua in linea recta motum, caeteris motum imprimit. Nisi probabile putemus quodlibet insecabile moveri in linea recta, alia atque alia, nimirum nullam duci posse rectam quin alicuius insecabilis directioni sit parallela. Ubi porro discutiendum, an omnes directiones debeant esse aequiveloces. An forte mirabilis quaedam observabitur proportio, ut sint directionum velocitates in reciproca ratione magnitudinis, adeoque
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Non assumo initio plenitudinem mundi, sed hoc tantum, quod facile quivis concedere se posse videt, ut scilicet in loco quolibet intelligi posse natare sive includi corpus aliquod loco ipso minus. Hoc jam uno posito, quod nullus sit locus in quo non existat aliquod corpus ipsi aequale vel ipso minus, sequitur nullam assignabilem Mundi partem esse vacuam, non tamen ideo dico spatium et corpus esse coextensa; imo contra sequitur non esse coextensa, quia sphaerae quotcunque non replent totum. Omnes tamen vacuitates in unum collectae non majorem haberent rationem ad spatium quoddam assignabile, quam angulus contactus ad rectilineum.

16. Guilielmi Pacidii De Rerum Arcanis

526 *Guilielmi Pacidii de Rerum Arcanis*

1) De Arte Rationis et Methodo inveniendae veritatis.
2) De Lingua Rationali, et de Artibus characteristica et combinatoria.
3) De Algebrae imperfectione et novo quodam Analyseos genere et de abdita Geometria.
4) De vera Metaphysica, deque idea et existentia Dei.*
527 5) De animabus, quod omnia sint animata,† sola autem immortalis reminiscatur sui.

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There are as many unsplittable bodies as there are vortices—that is, motions of surrounding sectors which are varied in relation to some one thing. But there is a difference between an unsplittable body which is at rest *per se* and is moved only by the motion of others, and one which is moved spontaneously in a straight line and makes other things move. Unless we think it probable that any unsplittable body whatsoever moves in some straight line or other, such that no straight line can be drawn which is not parallel to the direction of some unsplittable body. Here one must also discuss whether all movements in any direction[12] must have the same velocity. Or is a certain wonderful proportion observed, such that the velocities of things moving in various directions are in a reciprocal relation to their magnitude, and so each atom acts with equal force on the
526 universe? This seems to me to be most beautiful and consistent with the highest reason. So small atoms will be moved most rapidly.

I do not assume that plenitude of the world at the outset, but only this, whose acceptability is obvious to anyone: that it is intelligible that in any place there moves about, or is included, some body which is less than that place. This one thing being granted—that there is no place in which there does not exist some body which is equal to or less than it—it follows that no assignable part of the world is empty. However, I do not therefore say that space and body are co-extensive; on the contrary, it follows that they are not co-extensive, because spheres, however many they may be, do not fill a whole. However, all emptinesses collected into one have no greater ratio to any assignable space than the angle of contact has to a straight line.

16. Guilielmus Pacidius[1] on the Secrets of Things

A, No. 77

Early ? 1676[2]

526 *Guilielmus Pacidius on the Secrets of Things*[3]

1) On the art of reason, and on the method of discovering truth.
2) On a rational language, and on the arts of symbols and of combination.
3) On the imperfection of algebra, and on a new kind of analysis and on a hidden geometry.
4) On the true metaphysics, and on the idea and existence of God.*
527 5) On souls; that all things are animated,† but that only the immortal soul remembers itself.

*Marginal note: NB.
†Marginal note: NB.

6) Labyrinthus prior, seu de Fato, Fortuna, Libertate.
7) Labyrinthus posterior, seu de *Compositione* continui, tempore, loco, motu atomis, indivisibili et infinito.
8) Geometria motus seu linearum determinationes, centrobaryca, revocatio motus ad calculum.
9) Physica motus seu de potentia et concursu ac reactionibus.
10) De artibus Mechanicis, seu de motuum coordinationibus, pro corporum figura et consistentia et potentia.
11) Hypothesis Physica demonstrativa deque artibus physicis.
12) De abditis rerum causis et Medicina dogmatica constituenda.
13) De Naturae arcanis et corporum exaltatione et Tinctura.
14) De Luce Mentium et Amore Dei super omnia.
15) Demonstrationes Catholicae, seu de vera Ecclesia et Caritate.
16) De Iustitia et novo Codice.
17) De Majestate et Republica.
528 19) De Prudentia pragmatica, et historia nostri temporis.
20) De rebus Oeconomicis, deque incrementis civitatum, opificiisque et re mercatoria.
21) De arte ac disciplina militari ac bello sacro.
22) De educatione, literis et linguis.
23) De censura morum et casibus conscientiae.
24) De societate Theophilorum et perfectione Christiana.
25) Votum: sive fabula de emendatione rerum generali, et Historia seculi sequentis, incipit anno 1730.
26) Spes sive carmen de futura vita.

17. Quod Ens Perfectissimum Sit Possible

572 Demonstrationem reperisse videor, quod Ens perfectissimum, seu quod omnem Essentiam contineat, seu quod omnes habeat Qualitates, seu omnia attributa affirmativa, sit possibile, seu non implicet contradictionem.

Hoc patebit si ostendero omnia attributa (positiva) esse inter se compatibilia. Sunt autem attributa aut resolubilia, aut irresolubilia, si resolubilia sunt erunt aggregatum eorum in quae resolvuntur; suffecerit ergo ostendisse compatibilitatem omnium primorum, sive irresolubilium attributorum, sive quae per se concipiuntur, ita enim si singula compatibilia erunt, etiam plura erunt, adeoque et composita. Tantum ergo suffecerit

6) Labyrinthus prior, seu de Fato, Fortuna, Libertate.
7) Labyrinthus posterior, seu de *Compositione* continui, tempore, loco, motu atomis, indivisibili et infinito.
8) Geometria motus seu linearum determinationes, centrobaryca, revocatio motus ad calculum.
9) Physica motus seu de potentia et concursu ac reactionibus.
10) De artibus Mechanicis, seu de motuum coordinationibus, pro corporum figura et consistentia et potentia.
11) Hypothesis Physica demonstrativa deque artibus physicis.
12) De abditis rerum causis et Medicina dogmatica constituenda.
13) De Naturae arcanis et corporum exaltatione et Tinctura.
14) De Luce Mentium et Amore Dei super omnia.
15) Demonstrationes Catholicae, seu de vera Ecclesia et Caritate.
16) De Iustitia et novo Codice.
17) De Majestate et Republica.
528 19) De Prudentia pragmatica, et historia nostri temporis.
20) De rebus Oeconomicis, deque incrementis civitatum, opificiisque et re mercatoria.
21) De arte ac disciplina militari ac bello sacro.
22) De educatione, literis et linguis.
23) De censura morum et casibus conscientiae.
24) De societate Theophilorum et perfectione Christiana.
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6) The first labyrinth, or, on fate, fortune, freedom.
7) The second labyrinth, or, on the *composition* of the continuum,[4] on time, place, the motion of the atom, on the indivisible and the infinite.
8) The geometry of motion, or, the determinations of lines, the center of gravity, the reduction of motion to a calculus.
9) The physics of motion, or, on power, impact, and reactions.
10) On the mechanical arts, or, on the co-ordinations of motions in accordance with the shape, consistency, and power of bodies.
11) A demonstrative physical hypothesis, and on the arts of physics.
12) On the hidden causes of things, and on the establishment of a dogmatic medicine.[5]
13) On the secrets of nature, on the refining of bodies, and on tincture.[6]
14) On the light of minds, and on the love of God above all things.
15) Catholic demonstrations, or, on the true church and on charity.
16) On justice and on a new codex.
17) On majesty and the state.
528 19)[7] On prudence in action, and on the history of our time.
20) On economic matters, on the growth of states, on work and trade.
21) On the military art and discipline, and on holy war.[8]
22) On education, literature, and languages.
23) On the judgement of morals and on cases of conscience.
24) On the society of lovers of God and on Christian perfection.
25) A prayer: or, a fable about the general improvement of things, and on the history of the next century, beginning in the year 1730.
26) Hope, or, a poem about a future life.

17. That a Most Perfect Being is Possible

A, No. 79

November ? 1676[1]

572 I seem to have discovered a demonstration that a most perfect being—or one which contains all essence, or which has all qualities, or all affirmative attributes—is possible, or does not imply a contradiction.

This will be evident if I show that all (positive) attributes are compatible with each other. But attributes are either analyzable or unanalyzable; if they are analyzable they will be aggregates of those into which they are analyzed. It will therefore be sufficient to have shown the compatibility of all primary or unanalyzable attributes, or, of those which are conceived through themselves. For if individual attributes are compatible, so are several attributes, and so therefore are composite attributes. It will therefore be sufficient to show only the intelligibility of a being which contains

ostendere Ens intelligi posse, quod omnia attributa prima contineat, seu duo quaelibet attributa prima esse inter se compatibilia. Sunto illa *A, B*. Si ergo incompatibilia sint, ergo haec propositio: *qualitas A, et qualitas B non possunt esse in eodem subjecto,* erit necessaria, adeoque vel identica, vel demonstrabilis. Non potest esse identica, nam tunc *ubi sit A non posse esse B,* idem esset quod *A est A* vel *A est B,* adeoque alterum exprimeret exclusionem alterius, adeoque alterum eorum foret alterius negativum, quod est contra hypothesin, supposuimus enim omnia esse affirmativa. Non est demonstrabilis, nam si demonstretur, *ubi sit A non posse [esse] B,* id non fieri poterit nisi resolutione alterutrius vel utriusque. Quod est contra Hypothesin, supposuimus enim esse irresolubilia, demonstrari ergo non potest haec incompatibilitas. Nulla est ergo, adeoque duae quaelibet qualitates affirmativae sunt compatibiles, adeoque omnes omnibus; possibile est ergo Ens quod omnia habeat attributa.

Hinc jam porro videtur probari, Ens huiusmodi, quod est perfectissimum, esse necessarium; nam non potest esse, nisi rationem existendi habeat a se vel alio, non potest ab alio habere, cum omnia quae in alio intelligi possunt, jam in ipso intelligi possint, sive cum per se concipiamus sive nulla extra se habeat requisita. Ergo vel nullam habere potest existendi rationem, adeoque impossibile est, contra id quod ostendimus, vel eam habebit a se, adeoque erit necessarium.

Omne attributum mere affirmativum est infinitum; seu quantum maximum esse potest, seu continet omnia sui generis. Plura sunt necessario
573 attributa affirmativa prima; quia si unum tantum esset, una tantum res intelligi posset. Videntur negativae affectiones oriri non nisi ex affirmativorum pluralitate. Exempli causa cogitatio et extensio, nam cum impossibile sit cogitari extensum sine varietate, hinc sequitur certos aliquos extensi modos esse necessarios, eosque qui fuere sunt eruntve ab uno cogitari posse omnes. Unde patet origo et necessitas modificationis.

Res omnes non ut substantias* sed modos distingui, facile demonstrari potest, ex eo quod quae radicaliter distincta sunt, eorum unum sine altero perfecte intelligi potest, id est omnia requisita unius intelligi possunt, quin omnia requisita alterius intelligantur. At vero hoc ipsum non est in rebus, quia enim Ultima ratio rerum unica est, quae sola continet aggregatum omnium requisitorum, omnium rerum, manifestum est, omnium rerum

**over* substantias: radicaliter

all primary attributes, or, to show that any two primary attributes are compatible with each other. Let these attributes be A and B. If they are incompatible, then the proposition "Quality A and quality B cannot be in the same subject" will be necessary, and so will be either an identical proposition or one which is demonstrable. It cannot be an identical proposition; for then "Where A is, B cannot be" would be the same as "A is A" or "A is B," and so the one would express the exclusion of the other, and so one of them would be the negative of the other. But this is contrary to the hypothesis, for we have assumed that all attributes are affirmative. It is not demonstrable; for if one were to demonstrate, "Where A is, B cannot be," that could only be done by the analysis of one or other term, or of both. This is contrary to the hypothesis; for we have assumed them to be unanalyzable. Therefore this incompatibility cannot be demonstrated. Therefore there is no incompatibility, and so any two affirmative qualities are compatible, and so all such qualities are compatible with all. Therefore a being which has all attributes is possible.

Further, it seems that one can prove from this that a being of this kind, which is the most perfect, is necessary; for it cannot exist unless it has a reason for existing,[2] either from itself or from something else. But it cannot have this reason from something else; for everything that can be understood in something else can already be understood in the most perfect being itself, whether because we conceive it through itself, or because it has no requisites outside itself. Therefore either it can have no reason for existing, and so is impossible, which is contrary to what we have shown, or it will have a reason for existing from itself, and so it will be necessary.

Every purely affirmative attribute is infinite; or, it is as great as it can be, or contains all the things that belong to its genus. There are necessarily
573 several affirmative primary attributes; for if there were only one, only one thing could be understood. It seems that negative affections can arise only from a plurality of affirmative attributes—for example, thought and extension. For as it is impossible for something extended to be thought without variety, it follows that certain modes of extension[3] are necessary, and that all those which have been, are, or will be can be thought by one being. From this the origin and necessity of modification is evident.

It can easily be demonstrated that all things are distinguished, not as substances (i.e., radically) but as modes. This can be demonstrated from the fact that, of those things which are radically distinct, one can be perfectly understood without another; that is, all the requisites of the one can be understood without all the requisites of the other being understood. But in the case of things, this is not so; for since the ultimate reason of things is unique, and contains by itself the aggregate of all requisites of all things, it is evident that the requisites of all things are the same. So also is

requisita esse eadem; adeoque et essentiam, posito essentiam esse aggregtum omnium requisitorum primorum, omnium ergo rerum essentia eadem, ac res non differunt nisi modo, quemadmodum Urbs spectata ex summo loco differt a spectata ex campo. Si ea tantum realiter differunt, quae possunt separari seu quorum alterum perfecte sine altero intelligi potest, sequitur nihil realiter ab altero differe, sed omnia esse unum, quemadmodum disserit et Plato in *Parmenide*.

Omnium rerum ultima ratio eadem. Ultima ratio est aggregatum requisitorum sufficientium. Aggregatum requisitorum sufficientium est Essentia. Ergo omnium eadem est essentia. Videntur requisita dicere relationem ad existentiam, attributa ad essentiam. Attributum, affectio, proprietas, essentia. Attributum est praedicatum quod per se concipitur, sive irresolubile. Affectio est praedicatum compositum ex attributis. Proprietas est affectio continens omnia attributa. Essentia est pr [*breaks off*]

Scribenda est Metaphysica accuratis definitionibus ac demonstrationibus, sed nihil in ea demonstrandum, nisi quod sententiis receptis non nimis pugnet. Ita enim recipi poterit haec Metaphysica; quod si semel probata sit, postea si qui profundius scrutabuntur, ducent consequentias
574 necessarias ipsi. Praeterquam quod separato postea labore, via illis ad ratiocinandum de his rebus ostendi potest. Utile erit in hac metaphysica adjici passim magnorum Virorum autoritates, qui scilicet similiter ratiocinati sunt. Praesertim cum illae continent aliquid quod ad illustrandam sententiam videtur posse pertinere.

Attributum est praedicatum necessarium quod per se concipitur, seu quod in alia plura resolvi non potest.
Affectio est praedicatum necessarium resolubile in attributa, seu Affectio est praedicatum demonstrabile de subjecto.
Proprietas est affectio reciproca, sive affectio continens omnia subjecti attributa, sive ex qua omnia alia praedicata possunt demonstrari.
Essentia est id omne quod in re per se concipitur, id est aggregatum omnium attributorum.
Accidens rei est praedicatum contingens.

their essence, given that an essence is the aggregate of all primary requisites. Therefore the essence of all things is the same, and things differ only modally, just as a town seen from a high point differs from the town seen from a plain. If only those things are really different which can be separated, or, of which one can be perfectly understood without the other, it follows that no thing really differs from another, but that all things are one, just as Plato argues in the *Parmenides*.[4]

The ultimate reason of all things is the same. An ultimate reason is the aggregate of sufficient requisites. The aggregate of sufficient requisites is the essence. Therefore the essence of all things is the same. Requisites seem to indicate a relation to existence, attributes to essence. Attribute, affection, property, essence. An attribute is a predicate which is conceived through itself, or, is unanalyzable. An affection is a predicate which is composed of attributes. A property is an affection which contains all attributes. An essence is. . . .[5]

A metaphysics should be written with accurate definitions and demonstrations, but nothing should be demonstrated in it apart from that which does not clash too much with received opinions. For in that way this metaphysics can be accepted; and once it has been approved then, if people examine it more deeply later, they themselves will draw the necessary consequences. Besides this, one can, as a separate undertaking, show
574 these people later the way of reasoning about these things. In this metaphysics, it will be useful for there to be added here and there the authoritative utterances of great men, who have reasoned in a similar way; especially when these utterances contain something that seems to have some possible relevance to the illustration of a view.

An "attribute" is a necessary predicate which is conceived through itself, or, which cannot be analyzed into several others.
An "affection" is a necessary predicate which can be analyzed into attributes, or, an affection is a predicate which can be demonstrated of a subject.
A "property" is a reciprocal affection, or, an affection which contains all the attributes of a subject, or, from which all its other predicates can be demonstrated.
An "essence" is everything which is conceived in a thing through itself, that is, the aggregate of all attributes.
An "accident of a thing" is a contingent predicate.

18. Ens Perfectissimum Existit

575 Perfectiones, sive formae simplices, sive qualitates absolutae positivae, sunt indefinibiles sive irresolubiles

(sive cogitatio quae de ipsis habetur non potest in alias cogitationes simpliciores resolvi).

De termino irresolubili velut subjecto non potest demonstrari propositio universalis

(quoniam omnis demonstratio propositionis universalis fit per resolutionem subjecti).*

De quo nihil potest demonstrari de eo non possunt enuntiari nisi propositiones indemonstrabiles.

Propositiones necessariae indemonstrabiles sunt identicae

(nam solae sunt per se notae, aliae autem omnes earum ope accedentibus definitionibus sive resolutionibus denique ostendi possunt).

Propositiones indenticae sunt ut *A est A, B est B, C est C, A non est non A*, vel quod idem est (ex hypothesi diversitatis) *A non est B, A non est C, A non est BC* etc. ut *cogitatio est cogitatio, cogitatio non est non cogitatio,* sive *non est aliud a cogitatione, non est extensio.*

At propositio *A et B* (verbi gratia cogitationem et extensionem) *non posse esse in eodem subjecto* non est identica sive non est ex numero praecedentium

(aliud enim longe cogitationem non esse extensionem, aliud non posse esse in eodem subjecto).

Et tamen si vera esset universalis necessaria esset. Ergo haec propositio vera non est, sive possunt esse in eodem subjecto duae formae simplices quaelibet

(vera inquam non est, quia ut ostendimus omnis propositio universalis necessaria vera aut est indemonstrabilis ac proinde identica, aut demonstrabilis; istam autem patuit esse neutram, formae simplices possunt esse in eodem subjecto).

576 Ergo et quotlibet, par enim ratiocinatio est.

Et in his existentiam sive possibile est Ens quod cum caeteris omnibus perfectionibus etiam contineat Existentiam

(nam et existentia ex perfectionum sive qualitatum absolutarum positivarum numero est).

Ergo Ens perfectissimum existit, Q. E. D.

*Notavit hoc et Plato in *Theaeteto* loquens *περὶ στοιχείων*.

18. A Most Perfect Being Exists

A, No. 80

November ? 1676[1]

575 Perfections, or simple forms, or absolute positive qualities, are indefinable or unanalyzable

(or, the thought which is had of them cannot be analyzed into other more simple thoughts).

A universal proposition cannot be demonstrated of an unanalyzable term which is its subject

(for every demonstration of a universal proposition is done by the analysis of the subject).*

Only indemonstrable propositions can be stated about that of which nothing can be demonstrated.

Necessary indemonstrable propositions are identical

(for they alone are known *per se*, but all other propositions[2] can finally be shown by their help, together with definitions or analyses).

Identical propositions are such as "A is A," "B is B," "C is C," "A is not not-A," or what is the same (assuming diversity) "A is not B,"[3] "A is not C," "A is not BC," etc. For example, "Thought is thought," "Thought is not not-thought," or, "is not something different from thought," "is not extension."

But the proposition "A and B" (for example, thought and extension) "cannot be in the same subject" is not identical, or, is not one of the preceding propositions

(for to say that thought is not extension is very different from saying that they cannot exist in the same subject).

And yet if it were true, it would be a universal necessary proposition. Therefore this proposition is not true; that is, any two simple forms can exist in the same subject

(I say it is not true, for as we have shown, every true universal necessary proposition is either indemonstrable, and therefore identical, or it is demonstrable. But it has become clear that that proposition is neither. Simple forms can exist in the same subject).

576 Therefore as many simple forms as one pleases[5] can exist in the same subject; for the reasoning is the same.

And it is evident that existence is one of these; or a being which, along with all other perfections, also contains existence is possible

(for existence is one of the number of perfections, or absolute positive qualities).

Therefore a most perfect being exists. Q. E. D.

*[NOTE BY LEIBNIZ] Plato noted this in the *Theatetus* when speaking about "elements."[4]

Quicquid necessarium est necessario existit. Quicquid necessario existit existit. Ergo Ens necessarium existit. Conclusio sic intelligenda: si quod detur Ens necessarium existet, ostendendum solum est dari, scilicet in numero rerum possibilium sive intelligibilium.

Nota propositiones universales omnes postulant subjecti resolutionem. Esto *omne A est B*, si demonstrabilis est demonstrabitur resolutione vel ipsius *A*, vel ipsius *B*, vel utriusque: (Ergo si reciproca utriusque) si resolutione ipsius *A*, tantum habemus propositum, si resolutione utriusque, habemus etiam propositum. Superest ut quaeramus an sola resolutione ipsius *B*. Ponamus *B* solum resolvi. Fiet *omne B est CD*. Et *C* vel *D* rursus resolutis nihil fieri aliud potest, continuata utcunque resolutione quam *omne B est EFG* etc. In his *EFG* etc. aut continetur *A* expresse aut virtute, aut nullo modo. Si nullo modo continuata quantumvis resolutione contineatur *A*, nihil ex resolutione ipsius *B* potest demonstrari quod concernat *A*, sin virtute contineatur, id est definitione pro ipso prodeunte, substituatur in locum suae definitionis et expresse continebitur. Ponamus ergo expresse contineri *A*, in resolutione ipsius *B*, tantum inde sequetur *omne B est AH* etc. unde sequitur et *omne B est A*, vel *quoddam A est B*,
577 sed non inde sequetur *omne A est B*. Ergo opus resolutione ipsius *A*, ut inde oriri possit B, quod si reciproca sit propositio apparet hinc velut Corollarium eam demonstrari utriusque termini resolutione.

Hince omnes propositiones negativae demonstrabiles demonstrantur utriusque termini resolutione, sunt enim omnes reciprocae.

Quod Ens perfectissimum existit

Perfectionem voco omnem qualitatem simplicem quae positiva est, et absoluta, seu quae quicquid exprimit sine ullis limitibus exprimit. [Qualitas] autem eiusmodi quia simplex, ideo est indefinibilis sive irresolubilis, alioqui enim vel non una erit simplex qualitas sed plurium aggregatum, vel si una erit limitibus circumscripta erit atque ita ope negationum intelligetur contra hypothesin, assumta est enim pure positiva.

Ex his non est difficile ostendere omnes esse compatibiles inter se, sive in eodem esse posse subjecto.

Nam sit propositio eiusmodi *A et B sunt incompatibiles* (intelligendo per *A* et *B* duas eiusmodi formas simplices sive perfectiones). Patet eam

Whatever is necessary, necessarily exists.[6] Whatever necessarily exists, exists. Therefore a necessary being exists. The conclusion is to be understood in this way: if a necessary being which is given is to exist, it only has to be shown that it is given,[7] namely in the number of possible or intelligible things.

Note: all universal propositions require the analysis of the subject. Let the proposition be, 'Every A is B'. If this is demonstrable, it will be demonstrated by the analysis either of A, or of B, or of both. (Therefore, if it is reciprocal, by the analysis of both).[8] If it is demonstrated by the analysis of A alone, then we have what is proposed; if by the analysis of both terms, then we also have what is proposed. It remains to consider if the proposition can be demonstrated simply by the analysis of B. Let us assume that B alone is analyzed; the result will be "Every B is CD." And when C and D are analyzed in turn, all that can result (however far the analysis is continued) is "Every B is EFG," etc. In the terms EFG, etc., A is either contained (expressly or potentially) or it is in no way contained. If A is in no way contained, however far the analysis is continued, then nothing can be demonstrated about A as a result of the analysis of B. But if A is contained potentially, that is, if there is a definition which stands for it, then let it be substituted for its definition, and it will be contained expressly.[9] Let us therefore assume that A is contained expressly in the analysis of B; from this there follows only "Every B is AH," etc., from which there also follows, "Every B is A," or "Some A is B"; but "Every A
577 is B" will not follow. So one needs the analysis of A in order that B can arise from it. So if the proposition is reciprocal it follows from this, as a kind of corollary, that it is demonstrated by the analysis of each term.

Hence all negative propositions are proved to be demonstrable by the analysis of each term, for they are all reciprocal.[10]

That a Most Perfect Being Exists

I term a "perfection" every simple quality which is positive and absolute, or, which expresses without any limits whatever it does express. But since a quality of this kind is simple, it is therefore indefinable or unanalyzable. For otherwise it will either not be one simple quality, but will be an aggregate of several, or if it is one it will be enclosed by limits, and so will be understood by the help of negations, contrary to the hypothesis; for it was assumed to be purely positive.

From this it is not difficult to show that they are all compatible with each other, or, that they can be in the same subject.

For let there be a proposition of this kind: "A and B are incompatible" (understanding by A and B two simple forms of this kind, or, perfections).

non posse demonstrari sine resolutione terminorum *A* vel *B*, alterutrius vel utriusque, alioqui enim natura eorum non ingrederetur ratiocinationem, et incompatibilitas aeque de ipsis ac de quibusvis aliis rebus demonstrari posset. Atqui ex hypothesi sunt irresolubiles. Ergo haec propositio de ipsis demonstrari non potest.

Posset autem utique de ipsis demonstrari si vera esset, esset enim necessaria neque tamen per se nota. Ergo vera non est. Compatibiles ergo sunt omnes perfectiones. Datur ergo sive intelligi potest Ens quod sit subjectum omnium perfectionum sive perfectissimum. Unde ipsum existere statim patet, cum et existentia inter perfectiones contineatur.

19. Quod Ens Perfectissimum Existit

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Perfectionem voco omnem qualitatem simplicem quae positiva est et absoluta seu quae quicquid exprimit sine ullis limitibus exprimit.

Qualitas autem ejusmodi quia simplex est ideo est irresolubilis, sive indefinibilis, alioqui enim vel non una erit simplex qualitas, sed plurium aggregatum, vel si una erit limitibus circumscripta erit, adeoque per negationes ulterioris progressus intelligetur contra hypothesin, assumta est enim pure positiva.

Ex his non est difficile ostendere, *omnes perfectiones esse compatibiles inter se*, sive in eodem esse posse subjecto.

Nam sit propositio ejusmodi: *A et B sunt incompatibiles* (intelligendo per *A* et *B* duas ejusmodi formas simplices, sive perfectiones, idemque est si plures assumantur simul). Patet eam non posse demonstrari sine resolutione terminorum *A* vel *B*, alterutrius vel utriusque; alioqui enim natura eorum non ingrederetur ratiocinationem ac posset incompatibilitas aeque de quibusvis aliis rebus ac de ipsis demonstrari. Atqui (ex hypothesi) sunt irresolubiles. Ergo haec propositio de ipsis demonstrari non potest.

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579 biles aut per se notae. Ergo necessario vera non est haec propositio sive non est necessarium ut *A* et *B* in eodem subjecto non sint. Possunt ergo esse in eodem subjecto et cum eadem sit ratiocinatio de quibuslibet

It is evident that this cannot be demonstrated without an analysis of the terms A or B—either one or the other, or both—for otherwise their nature would not enter into the reasoning, and incompatibility could be demonstrated equally of them and of any other things whatsoever. But, by hypothesis, they are unanalyzable. Therefore this proposition cannot be demonstrated of them.

But it could be demonstrated of them if it were true, for it would be necessary but not self-evident. Therefore it is not true; therefore all perfections are compatible. Therefore there is given, or, there can be understood, a being which is a subject of all perfections, or, a most perfect being. Hence it is at once evident that it exists; for existence is contained among perfections.

19. That a Most Perfect Being Exists

A, No. 81

18–21 ? November 1676[1]

578 *That a Most Perfect Being Exists*[2]

I term a "perfection" every simple quality which is positive and absolute, or, which expresses without any limits whatever it does express.

But since a quality of this kind is simple, it is therefore unanalyzable, or indefinable. For otherwise it will either not be one simple quality, but an aggregate of several; or if it is one it will be enclosed by limits, and so will be understood through the negations of further progress, contrary to the hypothesis; for it was assumed to be purely positive.

From this it is not difficult to show that all *perfections are compatible with each other,* or, that they can be in the same subject.

For let there be a proposition of this kind: "A and B are incompatible" (understanding by A and B two simple forms of this kind, or, perfections; and it is the same if several are assumed at the same time). It is evident that this cannot be demonstrated without an analysis of the terms A or B—either one or the other, or both—for otherwise their nature would not enter into the reasoning, and incompatibility could be demonstrated equally of them and of any other things whatsoever. But (by hypothesis) they are unanalyzable. Therefore this proposition cannot be demonstrated of them.

But it could be demonstrated of them if it were true; for it is not self-evident, but all propositions that are necessarily true are either demonstra-
579 ble or self-evident. Therefore this proposition is not necessarily true; or, it is not necessary that A and B are not in the same subject. Therefore they can be in the same subject; and as the reasoning is the same with regard to

aliis ejusmodi qualitatibus assumtis, ideo compatibiles sunt omnes perfectiones.

Datur ergo sive intelligi potest subjectum omnium perfectionum, sive Ens perfectissimum.

Unde ipsum quoque existere patet, cum in numero perfectionum existentia contineatur.

(Idem ostendi potest etiam de formis compositis ex absolutis modo dentur.)

Ostendi hanc ratiocinationem D. Spinosae cum Hagae Comitis essem qui solidam esse putavit, cum enim initio contradiceret, scripto comprehendi et hanc schedam ei praelegi.

schol.

Cartesii ratiocinatio de Entis perfectissimi existentia supposuit Ens perfectissimum intelligi posse, sive possibile esse. Hoc enim posito quod detur ejusmodi notio, statim sequitur existere illud Ens, quoniam ipsum tale finximus ut statim existentiam contineat. Quaeritur autem an sit in nostra potestate tale Ens fingere, sive an talis notio sit a parte rei, clareque ac distincte sine contradictione intelligi possit. Dicent enim adversarii talem notionem Entis perfectissimi sive Entis per Essentiam existentis esse chimaeram. Nec sufficit Cartesium provocare ad experientiam, et allegare quod idem ejusmodi in se clare distincteque sentiat, hoc enim est abrumpere non absolvere demonstrationem, nisi ostendat modum, per quem alii quoque ad ejusmodi experientiam venire possint. Quotiescunque enim inter demonstrandum experientias allegamus, debemus aliis quoque modum ostendere faciendi eandem experientiam, nisi eos sola tantum autoritate nostra convincere velimus.

20. Principium Meum Est, Quicquid Existere Potest, Et Aliis Compatibile Est, Id Existere

581 2 Xbr. 1676.

Non est opus ad augendam rerum multitudinem pluribus mundis, neque enim ullus est numerus, qui non sit in hoc uno mundo, imo in qualibet ejus parte.

Introducere aliud genus rerum existentium, aliumque velut Mundum etiam infinitum. Est abuti existentiae nomine, neque enim dici potest an nunc existant illae res an non. Existentia autem ut a nobis concipitur involvit aliquod tempus determinatum, sive hoc demum existere dicimus,

aliis ejusmodi qualitatibus assumtis, ideo compatibiles sunt omnes perfectiones.

Datur ergo sive intelligi potest subjectum omnium perfectionum, sive Ens perfectissimum.

Unde ipsum quoque existere patet, cum in numero perfectionum existentia contineatur.

(Idem ostendi potest etiam de formis compositis ex absolutis modo dentur.)

Ostendi hanc ratiocinationem D. Spinosae cum Hagae Comitis essem qui solidam esse putavit, cum enim initio contradiceret, scripto comprehendi et hanc schedam ei praelegi.

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any other qualities of this kind that are assumed, all perfections are compatible.

Therefore there is given, or, there can be understood, a subject of all perfections, or, a most perfect being.

Hence it is evident that it also exists, for existence is contained in the number of perfections.

(The same can also be shown of forms that are composed of absolute forms, provided that they are given.)

I showed this argument to Mr. Spinoza when I was at the Hague, and he thought it to be sound. Since he contradicted it at first, I wrote it down and read this paper to him.

Scholium

Descartes' argument for the existence of a most perfect being assumed that a most perfect being can be understood, or, is possible. For assuming this—namely, that a notion of this kind is given—it follows at once that that being exists; for we have supposed it to be such that it immediately contains existence. But the question is, if it is in our power to suppose such a being, or, if such a notion really exists, and can be understood clearly and distinctly without contradiction. For opponents will say that such a notion of a most perfect being, or of a being that exists through its essence, is a chimaera. Nor is it enough for Descartes to appeal to experience, and allege that he senses something of this kind clearly and distinctly within himself. For this is to do away with proof, not to bring it to a conclusion—unless he shows a way in which others too can arrive at an experience of this kind. For as often as we adduce experiences in the middle of proving something, we ought to show others a method of bringing about the same experience, unless we want to convince them by our authority alone.

20. My Principle is: Whatever Can Exist and is Compatible with Others, Exists

A, No. 83

581 12 December 1676[1]

There is no need for the multitude of things to be increased by a plurality of worlds; for there is no number of things which is not in this one world, and indeed in any part of it.[2]

To introduce another genus of existing things, and as it were another world which is also infinite, is to abuse the name of existence; for it cannot be said whether those things exist now or not. But existence, as it is conceived by us, involves a certain determinate time; or, we say that that

de quo certo aliquo temporis momento dici potest, ista res nunc existit.

Multitudo est major rerum in toto quam in parte; etiam in infinita multitudine. De vacuo formarum non inutilis dissertatio ut ostendatur non omnia possibilia per se existere posse cum caeteris, alioqui multa absurda, nihil tam ineptum fingi posset, quod non esset in mundo, non tantum monstra, sed et mentes malae et miserabiles, item injustitiae, et nulla esset ratio cur Deus diceretur bonus potius quam malus; justus quam injustus. Esset aliquis mundus in quo omnes probi poenis aeternis punirentur, et omnes improbi pensarentur, felicitate luerent scelus.

Immortalitas mentis mea methodo statim probata habetur, quia possibilis in se, et aliis omnibus compossibilis, sive rerum cursum non immi-
582 nuit. Quia mentes *n'ont point de volume*. Principium autem meum est, quicquid existere potest, et aliis compatibile est, id existere. Quia ratio existendi pro omnibus possibilibus non alia ratione limitari debet, quam quod non omnia compatibilia. Itaque nulla alia ratio determinandi, quam ut existant potiora, quae plurimum involvant realitatis.

Si omnia possibilia existerent, nulla opus esset existendi ratione, et sufficeret sola possibilitas. Quare nec Deus foret nisi in quantum est possibilis. Sed talis Deus qualis apud pios habetur non foret possibilis, si eorum opinio vera est, qui omnia possibilia putant existere.

Dialogus de anima brutorum inter Pythagoram et Cartesium in Elysiis campis sibi obviam factos.

21. Definitio Dei Seu Entis A Se

582 *Definitio Dei Seu Entis a Se*

Deus est ens ex cuius possibilitate (seu essentia) sequitur ipsius existentia.

Si iam Deus hoc modo definitus est possibilis, sequitur quod existat.
583 Idem est ex alicuius possibilitate sequi existentiam, et ex alicuius essentia sequi existentiam, quia idem est rei essentia et specialis ratio possibilitatis, seu ex quo concepto rem possibilem esse distincte sive a priori

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thing exists of which it can be said at some certain moment of time, "That thing now exists."

The multitude of things is greater in the whole than in a part, even in an infinite multitude. It is not superfluous to discuss the vacuum of forms,[3] so that it can be shown that not all things which are possible *per se* can exist together with other things. For otherwise there will be many absurdities; nothing can be conceived which is so absurd that it does not exist in the world—not only monsters, but also evil and miserable minds, and also injustices, and there would be no reason why God should be called good rather than evil, and just rather than unjust. There could be some world in which all good people are punished with eternal penalties, and all evil people would be rewarded, and would expiate crime with happiness.

The immortality of the mind is proved immediately by my method. For it is possible in itself, and is compossible[4] with all other things; or, it does not impair the course of things.[5] This is because minds have no
582 volume. But my principle is: whatever can exist and is compatible with others, exists. For the sole reason for limiting existence, for all possibles, must be that not all are compatible. So the sole reason for limitation is that those things should preferably exist which involve the greatest amount of reality.

If all possibles were to exist, there would be no need of a reason for existing, and mere possibility would be enough. So there would not be a God, except in so far as he is possible. But a God of the kind in whom the pious believe would not be possible, if the opinion of those who believe that all possibles exist were true.

A dialogue concerning the souls of the brutes between Pythagoras and Descartes, who have met in the Elysian fields.[6]

21. A Definition of God, or, of an Independent Being

A, No. 84

December ? 1676[1]

582 *A Definition of God, or, of an Independent Being*[2]

God is a being from whose possibility (or, from whose essence) his existence follows.

If a God defined in this way is possible, it follows that he exists.

583 It is the same for existence to follow from the possibility of something, as it is for existence to follow from the essence of something. For the essence of a thing is the same as a special reason for possibility, i.e., from the conception of which it is conceived distinctly or *a priori* that the thing

concipitur: a priori inquam, id est non ab experientia, sed ex ipsa rei natura, quemadmodum numerum ternarium, lineam circularem, aliaque id genus possibilia esse concipimus, etsi nunquam ea reapse existere essemus experti, vel saltem nulla huius experimenti habita ratione.

Idem est Ens a se, et Ens ex cuius Essentia sequitur Existentia, nempe Ens cui essentiale est Existere, seu quod per suam essentiam existit.

Idem quoque est Ens necessarium, et Ens ex cuius essentia sequitur existentia; Ens scilicet necessarium est, quod necessario existit, ita ut ipsum non existere implicet contradictionem, atque adeo cum conceptu seu essentia huius Entis pugnet. Itaque de conceptu seu Essentia eius est existentia.

Hinc habemus praeclarum Theorema, quod est fastigium doctrinae Modalium, et quo transitur mirabili ratione, a potentia ad actum:

Si Ens necessarium est possibile, sequitur quod existat actu seu quod tale Ens actu reperiatur in Universo.

22. Catena Mirabilium Demonstrationum De Summa Rerum

584 2 X^{br} 1676

Catena Mirabilium Demonstrationum De Summa Rerum

Nihil simul est et non est, vel quidlibet vel est vel non est. Nunc aliquid fieri est circa praesentia. Praeteritum autem aut futurum, nunc aliquid suscipere, esset ipsum esse praesens; nihil autem simul praesens et praeteritum, hinc factum fieri non potest infectum, nec futurum aliquid esse desinit, nisi cum fit praesens.

Nihil est sine causa, quia nihil est sine omnibus ad existendum requisitis. *Effectus integer aequipollet causae plenae,* quia aequatio quaedam debet esse inter causam et effectum, transiens ex uno in aliud. Ea vero consistit in hac aequipollentia, nec alia mensura reperiri posset. Non nisi unum est genus Mundi, seu nulla dantur Entia praeter corpora et mentes, seu qualia sentimus, nec corpora, nisi quorum distantia certa a nobis. Nam si dentur, non poterit dici sintne nunc an non sint. Quod est contra primum principium. Hinc jam sequitur non omnia possibilia existere.

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is possible. I say "*a priori*"; that is, not from experience but from the very nature of the thing, just as we conceive the number 3, a circular line and other things of this sort to be possible, even if we have never experienced them to exist in reality, or at any rate do not take this experience into account.

An independent being is the same as a being from whose essence existence follows, namely a being to which existence is essential, or, which exists through its own essence.

Again, a necessary being is the same as a being from whose essence existence follows. For a necessary being is one which necessarily exists, such that for it not to exist would imply a contradiction, and so would conflict with the concept or essence of this being. And so existence belongs to its concept or essence.

From this we have a splendid theorem, which is the pinnacle of modal theory[3] and by which one moves in a wonderful way from potentiality to act:

If a necessary being is possible, it follows that it exists actually, or, that such a being is actually found in the universe.

22. A Chain of Wonderful Demonstrations about the Universe[1]

A, No. 85

584 12 December 1676

A Chain of Wonderful Demonstrations about the Universe[2]

Nothing is and is not at the same time, or anything either is or is not.[3] That anything comes about now is something that concerns present things. But to undertake now something that is either past or future would be for it to be present; but nothing is at the same time present and past, therefore what is done cannot be undone, nor does anything cease to be future except when it becomes present.

There is nothing without a cause, since there is nothing without all the requisites for existing. *The entire effect is equipollent to the full cause,*[4] since there must be some equality between cause and effect, passing from one to the other. But that consists in this equipollence, nor can another measure be found. There is only one kind of world, or, there are no entities besides bodies and minds, i.e., what we sense, nor are there any bodies except those which are at a certain distance from us. For if there were any, it could not be said whether they exist or do not exist now, which is contrary to the first principle.[5] So it follows that not all possibles exist.

Spatium et tempus esse infinita, quaerenda demonstratio perfecta. Dicere tempus fuisse sine rebus, est nihil dicere, quia eius temporis quantitas per nullam notam determinari potest. Quia causa aequipollet effectui non perfectione sed expressione, non potest aliquando incepisse creaturarum ordo, sed semper aliquid fuit praeter Deum seu Deus semper aliquid creavit, *pater meus usque operatur.* Magnum discrimen inter tempus et lineam, intervallum inter duos status momentaneos inter quos nihil intercessit nullo posset modo determinari, nec dici potest quot res interjici potuerint, cur enim non plures. Quod non est in spatio, ut si globus sit intus vacuus. Itaque quae in tempore inter quae nihil [intercedit], ea se tangunt, quod non est in spatio ob situm.

585 Spatium esse infinitum vel hinc demonstratur, quia qualecunque ponatur nulla est ratio cur non factum sit majus. Nullam autem rationem reddi posse patet, quia summa in eo homogeneitas, et eius existentia aliis rebus non obstat. Aliquid faciendum fuisse ex eo patet quia aliquid factum est, et quia nulla ratio determinans quantum, seu limitans, erit quantum maximum esse potest seu absolute infinitum.

Eodem argumento postea probatur etiam nullam dari vacuum vel interspersum vel magnum, quia omnia impleri possibile est. Aliunde peculiariter refutetur spatium magnum ultramundanum in quo infinito mundus finitus, quia materia haec in ipsum dispergeretur, neque unquam recolligeretur. Posita plenitudine demonstrantur *atomi*. Imo et sine plenitudine, ex ea sola consideratione quod omne flexile dividetur in puncta.

Videtur rationi valde consentaneum, ut *corpora* primitiva omnia sint sphaerica, directiones autem omnes rectilineae. Corpora cohaerentia ex eo, si scilicet corpora quaedam in fornicem componantur intus cavum, id est materia subtiliore plenum, qui fornix difficulter dissolvetur quia pori a componentibus relicti minores sunt, quam ut pervii sint materiae circumstanti ad locum replendum. Haec corpora firma fere in globosam quantumlibet redigentur formam, quia sic quam minime obstant circumstantibus, et quia id fieri potest sine dissolutione. Hinc omnia ex globis, et tametsi non essent globi infima elementa, tamen semper rediretur ad globos, inutilis ergo foret figurarum in Atomis varietas quare sufficit esse Atomos omnes globosas.

That space and time are infinite requires a complete demonstration. To say that there was a time without things is to say nothing, because the quantity of that time cannot be determined by any mark.[6] Since the cause is equipollent to the effect not in perfection but in expression, the order of creatures cannot have begun at some time, but there was always something besides God, or, God has always created something. "My father has never yet ceased his work."[7] There is a great difference between a time and a line. An interval between two momentary states, between which nothing has been interposed, cannot be determined in any way, nor can it be said how many things can be interposed; for why should there not be more?[8] This is not the case in space, if for example a globe is empty inside. So those things which are in time, and between which nothing is interposed, touch each other. This is not the case in space, on account of situation.

585 That space is infinite is also proved from this: that whatever size it is assumed to be, there is no reason why it should not have been made larger. But it is evident that no reason can be given, since there is in space the greatest homogeneity, and its existence does not impede other things. That something was to be done is evident from the fact that something has been done, and since there is no reason that determines or limits its size, it will be as big as it can be, or, absolutely infinite.

The same argument also proves that there is no vacuum, whether interspersed or great,[9] since it is possible for all things to be filled. One may also give, from another source, a special refutation of a great ultramundane space, which is infinite and in which there is a finite world; for this matter would be dispersed into it, and would never be brought together again. Plenitude being granted, *atoms* are proved. They are also proved without plenitude, from the mere consideration of the fact that everything which is flexible is divided into points.

It seems very much in accordance with reason that primitive *bodies* should all be spherical, but that their directions should all be rectilinear. Cohering bodies arise from the fact that, if certain bodies are put together into an arch which is hollow inside, i.e., full of a more subtle matter, this arch is broken up with difficulty because the pores which are left by its components are too small to be penetrated by surrounding matter, in such a way as to fill the space. These firm bodies may be reduced to a globular shape of almost any size, because in this way they obstruct surrounding bodies as little as possible, and because this can be done without their being broken up. So all things come from globes, and even if globes were not the fundamental elements, yet there would always be a return to globes;[10] so a variety of shapes in atoms would be useless, and so it is enough for all atoms to be globular.

Optima demonstratio, quod corpus a spatio seu extensione differat, ex eo sumitur, quod ex sola extensione seu longitudinis latitudinis et profunditatis notione demonstrari non potest impenetrabilitas, seu quod duo extensa non possint esse in eodem loco sive quod impossibile sit duo esse extensa, solida inter se congruentia, seu quorum nullum punctum sit Punctum, quod non distantia ab aliquo alterius puncto careat.

23. Cogitatio Non Est Motus

586 X^{br}. 1676

Quicquid a nobis immediate percipitur nec percipitur esse motus, id non est motus.

Cogitatio a nobis immediate percipitur nec percipitur esse motus.

Ergo cogitatio non est motus.

Minor ita probatur. Cogitationem esse motum percipitur vel sensu vel demonstratione ex eo quod sentimus ducta; non sensu percipitur, quia nemo dicere potest qualemnam sentiat motum: non demonstratione ex eo quod sentimus ducta; quia ipsius perceptionis simplicissima perceptio est, tametsi eius quod perceptum est, varietas magna sit. Ex simplicissimo autem nihil potest demonstrari: certe locum non involvit ipsa perceptio, etsi locum involvat objectum perceptionis. Ergo nec cogitatio, ergo nec motum, quia motus involvit locum. Ut accurata sit demonstratio debet ita fieri, si quid in se aliquid simplicissimum non involvit, nec involvit id
587 quod hoc simplicissimum continet (qui non habet partem non habet totum). Extensio est aliquid simplicissimum. In omni intellectione pura seu a characteribus purgata percipitur omnis forma simplex quam res involvit. Ergo si purgata a characteribus cogitatione aliqua forma simplex non deprehenditur in aliquo, ideo utique non inest.

24. De Existentia

587 Ad existentiam necesse est aggregatum omnium adesse Requisitorum.

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586 X^{br}. 1676

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Cogitatio a nobis immediate percipitur nec percipitur esse motus.

Ergo cogitatio non est motus.

Minor ita probatur. Cogitationem esse motum percipitur vel sensu vel demonstratione ex eo quod sentimus ducta; non sensu percipitur, quia nemo dicere potest qualemnam sentiat motum: non demonstratione ex eo quod sentimus ducta; quia ipsius perceptionis simplicissima perceptio est, tametsi eius quod perceptum est, varietas magna sit. Ex simplicissimo autem nihil potest demonstrari: certe locum non involvit ipsa perceptio, etsi locum involvat objectum perceptionis. Ergo nec cogitatio, ergo nec motum, quia motus involvit locum. Ut accurata sit demonstratio debet ita fieri, si quid in se aliquid simplicissimum non involvit, nec involvit id
587 quod hoc simplicissimum continet (qui non habet partem non habet totum). Extensio est aliquid simplicissimum. In omni intellectione pura seu a characteribus purgata percipitur omnis forma simplex quam res involvit. Ergo si purgata a characteribus cogitatione aliqua forma simplex non deprehenditur in aliquo, ideo utique non inest.

24. De Existentia

587 Ad existentiam necesse est aggregatum omnium adesse Requisitorum.

Optima demonstratio, quod corpus a spatio seu extensione differat, ex eo sumitur, quod ex sola extensione seu longitudinis latitudinis et profunditatis notione demonstrari non potest impenetrabilitas, seu quod duo extensa non possint esse in eodem loco sive quod impossibile sit duo esse extensa, solida inter se congruentia, seu quorum nullum punctum sit Punctum, quod non distantia ab aliquo alterius puncto careat.

23. Cogitatio Non Est Motus

586 X^{br}. 1676

Quicquid a nobis immediate percipitur nec percipitur esse motus, id non est motus.

Cogitatio a nobis immediate percipitur nec percipitur esse motus.

Ergo cogitatio non est motus.

Minor ita probatur. Cogitationem esse motum percipitur vel sensu vel demonstratione ex eo quod sentimus ducta; non sensu percipitur, quia nemo dicere potest qualemnam sentiat motum: non demonstratione ex eo quod sentimus ducta; quia ipsius perceptionis simplicissima perceptio est, tametsi eius quod perceptum est, varietas magna sit. Ex simplicissimo autem nihil potest demonstrari: certe locum non involvit ipsa perceptio, etsi locum involvat objectum perceptionis. Ergo nec cogitatio, ergo nec motum, quia motus involvit locum. Ut accurata sit demonstratio debet ita fieri, si quid in se aliquid simplicissimum non involvit, nec involvit id
587 quod hoc simplicissimum continet (qui non habet partem non habet totum). Extensio est aliquid simplicissimum. In omni intellectione pura seu a characteribus purgata percipitur omnis forma simplex quam res involvit. Ergo si purgata a characteribus cogitatione aliqua forma simplex non deprehenditur in aliquo, ideo utique non inest.

24. De Existentia

587 Ad existentiam necesse est aggregatum omnium adesse Requisitorum.

The best proof that body differs from space or extension is derived from this: that one cannot, from extension alone, or, from the notion of length, breadth, and depth, demonstrate impenetrability, i.e., demonstrate that two extended things cannot be in the same place, or, that it is impossible for two extended solids to be congruent with each other, i.e., to be solids of which every point is a point which lacks distance from some point of the other.

23. Thought Is Not Motion

A, No. 86

586 December 1676[1]

Whatever is immediately perceived by us and is not perceived to be motion, is not motion.

Thought is immediately perceived by us and is not perceived to be motion.

Therefore thought is not motion.

The minor premise is proved in this way. That thought is not motion is perceived either by sensation, or by a demonstration derived from that which we sense. It is not perceived by sensation, because no one can say what kind of motion he senses.[2] It is not perceived by a demonstration derived from that which we sense, for the perception of perception itself is most simple, even though the variety of that which is perceived is great. But from something which is most simple, nothing can be demonstrated; certainly, perception itself does not involve place, even if the object of perception involves place. Therefore neither does thought involve place; nor does it involve motion, since motion involves place. For the demonstration to be accurate, the following must hold: if something does not involve in itself that which is most simple, neither does it involve that
587 which contains this most simple thing. (He who does not have the part does not have the whole). Extension is something which is most simple.[3] In every act of understanding which is pure, i.e., free from symbols, there is perceived every simple form which a thing involves. Therefore if thought which is free from symbols does not perceive some simple form in something, that simple form is not in that something.[4]

24. On Existence

A, No. 87

587 December ? 1676[1]

For existence, it is necessary that the aggregate of all requisites is present.

Requisitum est id sine quo res esse non potest. Aggregatum omnium requisitorum est causa plena rei. Nihil est sine ratione. Quia nihil est sine aggregato omnium requisitorum. In corporibus non est ratio existendi. Ut facile demonstrari potest, nimirum etiam si in infinitum regrediaris, multiplicabis tantum corpora; rationem cur sic sit, potius quam aliter non intelliges. Aggregatum omnium Requisitorum corporis cuiuslibet dati, extra corpora est. Aggregatum omnium requisitorum unius corporis, et aggregatum omnium requisitorum alterius est in uno eodemque. Illud unicum quodcunque sit est ultima ratio rerum. Nam quod de corporibus, idem de aliis quibuscunque verum est, quae non existunt necessario, seu in quibus ipsis non est ratio existendi. Ens necessarium non nisi unicum est. Ens necessarium in se omnium rerum requisita continere. Ens necessarium agere in se ipsum, sive cogitare. Nihil aliud enim cogitare quam se sentire. Ens necessarium agere per simplicissima. Nam ex infinitis possibilibus sunt quaedam simplicissima, sed simplicissima quae plurimum
588 praestant. Cuius rei ratio est, quia nulla est ratio quae caetera determinet. Harmonia hoc ipsum est, simplicitas quaedam in multitudine. Et in eo consistit pulchritudo et voluptas. Itaque res existere idem est, quod a Deo intelligi optimas, sive maxime ἁρμονικάς. Existentiae ideam nullam habemus, quam ut res intelligamus sentiri. Nec alia esse potest, quia existentia in ipsa [essentia] nisi necessariorum non includitur. Sine sentientibus nihil existeret. Sine uno primo sentiente, quod idem et causa rerum est nihil sentiretur. Exigit harmonia rerum, ut essent in corporibus quae agerent in se ipsa. De natura entis in se ipsum agentis. Agit per simplicissima; in eo enim est harmonia, ubi semel coepit, aeternum est. Eorum quae sensit egitque in eo ideae sunt, ut in Deo, nisi quod in Deo omnium et simul. Mens nullius unquam rei obliviscitur, quia ideae in ipsa mente sunt indelebiles. Motus semel datus necessario continuatur. Cogitatio seu sensus sui, seu actio in seipsum necessario continuatur sed agentis in seipsum actionem in corpus nondum video necessario continuari; quod autem continuatur, oritur ex harmonia rerum; id est a Dei voluntate. Miracula agi ope Mentium quarundam. Mentes quasdam singulariter uniri posse Deo, quibus scilicet detur actio perfecta secundum rationem: Et corporibus earum tanta motus vis, ut a circumfusis superari non possint.

A requisite is that without which a thing cannot exist. The aggregate of all requisites is the full cause of a thing. There is nothing without a reason; for there is nothing without an aggregate of all requisites. The reason for existence is not in bodies, as can easily be demonstrated. For even if you go back to infinity,[2] you will only multiply bodies; but you will not understand the reason why it should be so and not otherwise. The aggregate of all the requisites of any given body is outside bodies. The aggregate of all the requisites of one body, and the aggregate of all the requisites of another, is in one and the same being. That one being, whatever it is, is the ultimate reason of things. For what is true of bodies is true of all other things, whatever they may be, which do not exist necessarily, or, the reason for whose existence is not in themselves. A necessary being is not other than unique. A necessary being contains in itself the requisites of all things. A necessary being acts on itself, or, it thinks. For to think is nothing other than to sense oneself. A necessary being acts through the simplest means. For out of the infinitely many possibles, some are the simplest; but the simplest are those which provide the most. The reason
588 for this is that there is no reason which limits the rest.[3] Harmony is just this: a certain simplicity in multiplicity. Beauty and pleasure also consist in this. So for things to exist is the same as for them to be understood by God to be the best, i.e., the most harmonious. We have no idea of existence, other than that we understand things to be sensed.[4] Nor can there be any other idea of existence, since existence is included in the essence of necessary beings alone. Without sentient beings, nothing would exist. Without one primary sentient being, which is the same as the cause of all things, nothing would be sensed. The harmony of things requires that there should be in bodies beings which act on themselves. On the nature of a being that acts on itself: it acts by the simplest means, for in that there is harmony. Once it has begun, it is eternal. There are ideas in it of those things it has sensed and done, as there are in God; the difference is that in God the ideas are of all things and are simultaneous. The mind never forgets anything, since the ideas in the mind are indestructible. Motion, once given, is necessarily continued. Thought, or the sensation of oneself, or action on oneself, is necessarily continued. But I do not at present see that, when an agent that acts on itself acts upon the body, this action is necessarily continued. That it is continued arises out of the harmony of things; that is, by the will of God. Miracles are performed with the help of certain minds. Certain minds can be united uniquely with God: namely, those to which there is granted perfect action in accordance with reason, and whose bodies are granted so much power of motion that they cannot be overcome by those which surround them.

X^{br} 1676

399 Mirum non est numerum omnium numerorum, omnes possibilitates, omnes relationes seu reflexiones non distincte intelligi, sunt enim imaginariae nec quicquam respondens habent a parte rei. Ut si relatio sit inter *a* et *b*, eaque relatio vocetur *c*, et consideretur relatio nova inter *a* et *c*, eaque vocetur *d*. Et ita porro in infinitum, non videtur dicendum omnes istas relationes esse veras quasdam realesque ideas. Forte ea tantum mera
400 intelligibilia sunt, quae produci possunt, id est quae producta sunt aut producentur.

Dubium nullum est quin Deus intelligat quomodo nos res percipiamus. Quemadmodum si quis perfectam urbis notitiam dare velit is pluribus modis eam repraesentabit. Et haec Dei intellectio quatenus nostrum intelligendi modum intelligit, simillima est nostrae intellectioni, imo nostra ex ipsa resultat unde nos possumus dicere Deum habere intellectum nostro quodammodo similem, prorsus enim Deus res intelligit ut nos; sed eo discrimine quod simul etiam aliis modis infinitis eas intelligat, nos uno tantum.

Si fingi posset mentem esse sine corpore, homo eodem modo omnia ageret, ac si mentem non haberet; et homines et locuturi eadem essent, et scripturi, nescientes quae facerent. Quemadmodum cum ludunt. Sed haec fictio ut corpus sit sine mente est impossibilis.

Substantia seu Ens completum mihi est illud quod solum involvit omnia, seu ad cuius perfectam intelligentiam nullius alterius opus est intellectione. Talis non est figura, nam ut intelligamus unde orta sit eiusmodi figura recurrendum ad motus. Unumquodque Ens completum non nisi uno modo produci potest: Figurae quod diversis produci possunt modis, satis hoc indicio est non esse Entia completa.

Ex principio illo, quod effectus integer debet aequipollere causae plenae demonstratur omnia esse plena. Hinc patet dari infinitum actu, quia conservatur impetus ope materiae circumfusae quae continuat motum corpore cessante, atque ita corpus secum aufert, hoc non fiet exacte, nisi materia secunda sine fine subdivisa fit. Imo forte nec aliter fieri posset motus (posito omnia corpora se tangere).

25. Notes on Metaphysics

A, No. 39

December 1676

399 It is not surprising that the number of all numbers, all possibilities, all relations or reflections are not distinctly understood; for they are imaginary and have nothing that corresponds to them in reality. For example, suppose that there is a relation between *a* and *b*, and that that relation is called *c;* and let a new relation be considered between *a* and *c*, and let that relation be called *d*, and so on to infinity. It does not seem that any one may say that all those relations are true and real ideas. Perhaps only those
400 things are purely intelligible which can be produced; that is, which have been or will be produced.

There is no doubt that God understands how we perceive things; just as someone who wants to provide a perfect conception of a town will represent it in several ways. And this understanding of God, in so far as it understands our way of understanding, is very like our understanding. Indeed, our understanding results from it, from which we can say that God has an understanding which is in a way like ours. For God understands things as we do but with this difference: that he understands them at the same time in infinitely many other ways, whereas we understand them in one way only.[1]

If it could be supposed that a body exists without a mind,[2] then a man would do everything in the same way as if he did not have a mind, and men would speak and write the same things, without knowing what they do, just as when they are playacting. But the supposition that the body exists without a mind is impossible.

In my view a substance, or, a complete being, is that which by itself involves all things, or, for the perfect understanding of which the understanding of nothing else is required. A shape is not of this kind; for in order to understand from what a shape of such and such a kind has arisen, we need to have recourse to motion. Each complete being can be produced in only one way; the fact that figures can be produced in various ways is a sufficient indication that they are not complete beings.

From the principle that the entire effect must be equipollent to the full cause[3] it is demonstrated that all things are full. Hence it is evident that there is an actual infinite; for impetus is conserved with the help of surrounding matter, which continues its motion when the body is inactive, and so carries the body along with it. But this will not happen exactly, unless it happens by means of the second matter[4] which is subdivided without end. Indeed, perhaps motion could not come about in any other way (assuming that all bodies touch each other).

Notes

Introduction

1. See, e.g., H. J. M. Bos, "The influence of Huygens on the formation of Leibniz's ideas," *Studia Leibnitiana Supplementa* 17 (1978), p. 61: when Leibniz travelled to England early in 1673, "He was rather harshly confronted with his ignorance of current mathematical literature."

2. To Foucher, 1675 (A II.1, 247; GP I, 371). Cf. A 213.

3. A I.1, 491.

4. Unless otherwise specified, all translations from Leibniz are my own.

5. See, e.g., E. J. Aiton, *Leibniz: A Biography* (Bristol: Hilger, 1985), p. 57.

6. During Leibniz's stay in Paris, the volume of his works on mathematics, science, and technology was more than ten times that of his works on philosophy (A xv–xvi).

7. The dialogue, incidentally, may have been begun before Leibniz came to Paris (A xxii).

8. Jagodinsky's edition, though it includes many of the papers from this period which are of philosophical interest, does not include Nos. 59, 61, 62, 63, 64, 66, 76, and 77 of the Academy Edition.

9. A 472, 475

10. Albert Rivaud pointed out in a classical review (*Revue de Métaphysique et de morale* 22 (1914), pp. 94 ff. that Jagodinsky ran together different pieces, omitted words and phrases, and altered the punctuation. The edition also contains serious misreadings: e.g. in the paragraph printed in Jagodinsky, pp. 112–14 (A 511–12), "Neque pono" is printed for "Porro," "horum, cum" for "horum enim," "Quae cur ita sint" for "Quae cum ita sint," and "video" for "ideo." The editors of the Academy Edition also note that Jagodinsky sometimes failed to notice that different sheets of paper belong to the same work (see in particular Academy Edition, Nos. 68, 69, and 74).

11. A, Nos. 59, 63–66, 69, 78.

12. These constitute A, Nos. 36 and 39; they are printed in the section of the volume that is devoted to "Annotata."

13. I say "first major attempt": it has been persuasively argued (Konrad Moll, *Der junge Leibniz* [Stuttgart–Bad Cannstatt: Fromman-Holzboog, Vol. I, 1978; Vol. II, 1982]) that Leibniz's first sketch of a system is contained in two letters which he wrote to his former teacher Jakob Thomasius in October 1668 and April 1669 (A II.1, 10–11, 14–24. Leibniz published a revised version of the second of these at the end of his Preface to an edition of Nizolius [1670: A VI.2, 433–44; GP IV, 162–74]). But this sketch is far less extensive, and the system presented is far less mature, than that contained in the *De Summa Rerum*.

14. For Leibniz's anxiety not to be tedious, see, e.g., a letter to the Landgraf Ernst von Hessen-Rheinfels, 8 December 1686 (GP II, 81–82), in which Leibniz says that he is dealing with subjects which are "unprepossessing and most often scorned by the liveliest people, most excellent in the affairs of the world" (H. T. Mason, trans., *The Leibniz-Arnauld Correspondence* [Manchester: Manchester University Press, 1967], p. 102).

15. On the importance of such writings, cf. E. Hochstetter, "Von der wahren Wirklichkeit bei Leibniz," in *Zeitschrift für philosophische Forschung* 20 (1966), p. 423. This is also contained in A. Heinekamp and F. Schupp, eds., *Leibniz' Logik und Metaphysik* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1988), p. 453.

16. The only exception is provided by Nos. 17–19 below, consisting of two drafts and the final version of a paper submitted to Spinoza.

17. This, incidentally, is not peculiar to Leibniz's philosophical papers. Speaking of Leibniz's mathematical manuscripts from the Paris period, Eberhard Knobloch remarks that Leibniz often changed the object of his interest, and frequently dealt with several themes in one and the same manuscript. E. Knobloch, "Die unveröffentlichen mathematischen Arbeiten von Leibniz (1672–1676)," *Studia Leibnitiana Supplementa* 16 (1978), p. 6.

18. I have attempted this in my paper "Leibniz's *De Summa Rerum:* A Systematic Approach," *Studia Leibnitiana* 18 (1986), pp. 132–51.

19. With this proposition, compare the last two sentences of a paper, *On the Elements of Thinking*, A 507.

20. To Foucher, 1675 (A II.1, 248; GP I, 372). Cf. A II.1, 246; GP I, 370.

21. *De synthesi et analysi universali*, 1683–86 (GP VII, 296; on the date, see VE Fasc. 5, p. 900). See also Notes on Descartes, c. 1690 (GP IV, 327); *Animadversiones* on Descartes' *Principles*, 1692 (GP IV, 357); *De modo distinguendi*, 1683–86 (GP VII, 319; cf. VE Fasc. 3, p. 476); *De principiis*, after 1686 (C 183; cf. VE Fasc. 5, p. 908); *Nouveaux Essais*, 1703–04, 2.23.15; 4.2.1; 4.7.7; 4.9.2.

22. To be exact, these are "absolute identical propositions," and are to be distinguished from the "hypothetical identical proposition," "If A is B and B is C, then A is C."

23. C 518. The watermark suggests a date of 1689 for this paper (VE Fasc. 8, p. 1998). In this passage, Leibniz regards as an identical proposition the proposition that each thing is equal to itself; on this, cf. A 483.

24. 18–21 Nov. 1676 (A 579). Leibniz is here discussing the possibility of a most perfect being (on which see Section 3 below), but the argument is of general application.

25. *Animadversiones* on Descartes' *Principles*, 1692 (GP IV, 357). Cf. Remarks on Locke's *Essay*, 1695 ?–97 (A VI.6, 4; GP V, 14); to Clarke, Paper 2, Nov. 1715, sec. 1 (GP VII, 355); Appendix to *Théodicée*, 1710 (GP IV, 413). It is also noteworthy that in the *De Summa Rerum* Leibniz equates the principle of contradiction with the principle of excluded middle, "Anything either is or is not" (A 584). Cf. *De verum a falso distinguendi criteriis*, 1685–87 (GP VII, 299; cf. VE Fasc. 6, p. 1172); *Nouveaux Essais*, 1703–04, 4.2.1.

26. To Foucher, 1686 (GP I, 382). In the *Nouveaux Essais*, 4.2.14, Leibniz said of Foucher that he was "a learned and shrewd man, but rather too enthusiastic about his Academics, whose sect he would have liked to resuscitate."

27. In a paper written during the period of the *De Summa Rerum, Sur les premières propositions et les premiers termes*, early 1676–autumn 1676? (A 435; also C 186), Leibniz offers a different defence of the principle of identity. He says, "The senses makes us see that 'A is A' is a proposition whose opposite, 'A is not not

A,' formally implies a contradiction. Now, what the senses make one see is indemonstrable." To this it may be replied that the senses do not make one see that "A is A" is a proposition; this is something that has to be grasped with the help of the understanding.

28. *Primae Veritates*, c. 1689 (C 518). Compare a paper on freedom (Foucher de Careil, p. 181), written probably in 1689 (VE Fasc. 8, p. 1767).

29. Cf. a paper of Dec. 1675 (A 462), which states that a demonstration is a connection of definitions. The same point is made in a scientific paper written by Leibniz in summer 1676, *De Arcanis Motus et Mechanica ad puram Geometriam reducenda* (Heinz-Jürgen Hess, ed., *Studia Leibnitiana Supplementa* 17 [1978], p. 203), "Every demonstration is made by means of definitions, by analysis into identical propositions."

30. Foucher de Careil, p. 181. For the date, cf. note 28.

31. Compare a letter to Conring, 29 March 1678 (A II.1, 398; GP I, 194).

32. To Magnus Hesenthaler, 1671 (A II.1, 200); for Gallois, 1672 (A II.1, 229); *Elementa Juris Naturalis*, 1670–71? (A VI.1, 461). It should be added that Leibniz constantly stressed the importance of a critical approach to what were commonly regarded as axioms, and of reducing them to identical propositions where possible. See, e.g., *Demonstratio propositionum primarum*, autumn 1671–early 1672? (A VI.2, 479–80); *Recommendation pour instituer la science générale*, 1685–86? (GP VII, 165; cf. VE Fasc. 6, p. 1184); *Animadversiones* on Descartes' *Principles*, 1692 (GP IV, 355); *Nouveaux Essais*, 1703–04, 1.3.20; 4.7.1; 4.7.10. The desirability of a demonstration of supposed axioms is also mentioned in a letter from the period of the *De Summa Rerum:* to Mariotte, July 1676 (A II.1, 270). Here Leibniz speaks of those who, like the French mathematician Roberval, "wish to demonstrate everything that can be demonstrated," and says that such people are not to be discouraged.

33. *Elementa Juris Naturalis*, 1670–71? (A VI.1, 461); *Specimen Calculi Universalis* (C 242) and *Ad Specimen Calculi Universalis Addenda* (GP VII, 226: these two papers were written probably between 1678 and 1684; VE Fasc. 1, pp. 94, 107); *Generales Inquisitiones*, 1686 (C 365).

34. *Characteristica verbalis*, c. 1679 (C 432; cf. VE Fasc. 5, p. 1057). See also *Analysis Linguarum*, 11 Sept. 1678 (C 351); *Fundamenta Calculi Ratiocinatoris*, 1688–89? (GP VII, 204; cf. VE Fasc. 6, p. 1203).

35. More specifically, in the context of the ontological argument for the existence of God. This will be discussed later in the section.

36. A 311. The notes were written probably in 1676.

37. We will return to the topic of ideas later, in the context of Leibniz's account of the human mind (Section 10, p. xlv).

38. Descartes is mentioned in a note to the paper written for Spinoza (A 579); he is also clearly one of the "others" who are said to have advanced an argument similar to Anselm's (A 511).

39. *De Synthesi et Analysi Universali*, 1683–86? (GP VII, 294; cf. VE Fasc. 5, p. 900); *Specimen Inventorum*, (GP VII, 310. VE Fasc. 3, p. 482 suggests a date between 1677 and 1695 for this work. But a reference in the work (GP VII, 309) to

the thesis that contingent truths need an infinite analysis, which appears to be new with the *Generales Inquisitiones* of 1686 (C 388–89), suggests a date between 1686 and 1695).

40. A 395–96, 572, 575, 577, 578–79.

41. I have given an exposition of the argument in my *Logic and Reality in Leibniz's Metaphysics* (Oxford: Clarendon Press, 1965; reprinted New York, Garland, 1985), pp. 79–82.

42. Grua, p. 325. For the date, see VE Fasc. 6, p. 1252.

43. To be exact, Spinoza says that a being to whose essence existence belongs is a "cause of itself" (*Ethics* I, Def. 1), and on this definition he bases the first of his arguments for the existence of God in *Ethics* I, Prop. 11.

44. Discussion with Eckhard, 15 April 1677 (A II.1, 312; GP I, 212–13); *Animadversiones* on Descartes' *Principles*, 1692 (GP IV, 359); *Extrait d'une lettre*, Sept. 1701 (GP IV, 405); to Bierling, 10 Nov. 1710 (GP VII, 490).

45. Besides the passages cited in the above note, see A 576, 582–83.

46. To Eckhard, 28 April 1677 (A II.1, 323; GP I, 223–24). See also discussion with Eckhard, 15 April 1677 (A II.1, 312; GP I, 212–13).

47. This principle is stated with reference to God's omniscience, but it can be generalised.

48. Compare *Discours de Métaphysique*, 1686, sec. 35 (GP IV, 461).

49. On this, compare Section 7., p. xxxv.

50. Absolute existence is mentioned in another paper (A 396), but is there said to be, not perfection, but "eternity or necessity." On eternity, see also Section 7, p. xxxvii.

51. An answer may perhaps be provided by the *Discours de Métaphysique*, 1686, sec. 1 (GP IV, 427). Here, Leibniz says that it is a mark of perfection that those forms or natures which do not admit of an ultimate degree, such as number or shape, are not perfections.

52. Cf. A 465: God acts on himself because he is the cause of himself.

53. Cf. A 465: God understands because he acts on himself.

54. Compare what is said about the principle of harmony, Section 4, pp. xxv–xxvii.

55. For other formulations, see the author's *Logic and Reality in Leibniz' Metaphysics*, pp. 59–62.

56. To Clarke, Paper 2, Nov. 1715, sec. 1 (GP VII, 355).

57. *Discours de Métaphysique*, 1686, sec. 13 (GP IV, 438); cf. *Monadology*, 1714, secs. 33–35 (GP VI, 612); To Clarke, Paper 2, Nov. 1715, sec. 1.

58. Compare, from the period during which the *De Summa Rerum* was written, a letter to Foucher, 1675 (A II.1, 245; GP I, 369).

59. Cf. *Confessio Philosophi*, autumn 1672–winter 1672–73? (A 126): "I will therefore call that 'necessary' whose opposite implies a contradiction."

60. E.g., *Discours de Métaphysique*, 1686, sec. 13 (GP IV, 437); *De Rerum Originatione Radicali*, 1697 (GP VII, 302); *Causa Dei*, 1710, sec. 21 (GP VI, 441); to Clarke, Paper 5, Aug. 1716, sec. 4 (GP VII, 389).

61. For a fuller account, see the author's *Logic and Reality in Leibniz's Metaphysics*, pp. 62–68.

62. See, e.g., to Magnus Wedderkopf, May ? 1671 (A II.1, 117); *Confessio Philosophi*, Autumn 1672–Winter 1672–73 (A 132).

63. *Discours de Métaphysique*, 1686, sec. 13 (GP IV, 438); to Arnauld, 14 July 1686 (GP II, 56).

64. Hence, perhaps, his phrase "the principle of the need for giving a reason" (*principium reddendae rationis*), *Specimen Inventorum*, 1686–95? (GP VII, 309).

65. *Critique of Pure Reason*, B 638 (trans., Kemp-Smith).

66. The argument there proceeds, not from the mere existence of bodies, but from their motion.

67. See also *Specimen Inventorum*, 1686–95 (GP VII, 310); *Principes de la Nature et de la Grâce*, 1714, sec. 8 (GP VI, 602).

68. A VI.1, 492; GP IV, 109. Compare, from much later, *Monadology*, 1714, secs. 36–39 (GP VI, 612–13).

69. To Clarke, Paper 5, Aug. 1716, sec. 9 (GP VII, 390); *Théodicée*, 1710 (GP VI, 44). Also called "the principle of fitness" (*convenance*), *Monadology*, 1714, sec. 46 (GP VI, 614); *Principes de la Nature et de la Grâce*, 1714, sec. 11 (GP VI, 603); a paper on the division of philosophy, written after 1696 (C 528). It is also called "the principle of perfection," *De Libertate*, date uncertain (Grua, 288; cf. VE Fasc. 2, p. 275); *De Rerum Originatione Radicali*, 1697 (GP VII, 304). Leibniz sometimes distinguishes the principle of sufficient reason from that of the best, as in C 528, but he sometimes uses the term "principle of sufficient reason" to refer to what is in fact the principle of the best. See, e.g., to Clarke, Paper 2, Nov. 1715, sec. 1, and the author's *Logic and Reality in Leibniz's Metaphysics*, pp. 105–06.

70. Cf. to Clarke, Paper 5, sec. 9.

71. In a letter to Wedderkopf of 1671 (A II.1, 117), Leibniz says that God wills what he understands to be most harmonious.

72. Spinoza is an obvious example; however, in the *Théodicée*, secs. 170–73 (GP VI, 212–17) Leibniz lists also Diodorus the Megarian, Abelard, Wyclif, and Hobbes.

73. Cf. *Elementa Juris Naturalis*, 1670–71? (A VI.1, 484), referred to in a letter to Arnauld, Nov. 1671 (A II.1, 174; GP I, 73).

74. *Confessio Philosophi*, autumn 1672–winter 1672–73? (A 122). See also *De Conatu et Motu*, 1671 (A VI.2, 283).

75. Cf. A 582: those things are preferable which involve the greatest amount of reality.

76. *De Rerum Originatione Radicali*, 1697 (GP VII, 303). Cf. *Discours de Métaphysique*, 1686, secs. 5–6 (GP IV, 430–31).

77. Similarly, if Leibniz is to be consistent, then when he says at the end of the preceding paper (A 507), "I am conscious of this or that, namely that which I sense," that of which he is conscious must be an appearance.

78. This topic is discussed more fully in Section 8.

79. Cf. to Foucher, 1675 (A II.1, 248; GP I, 372): "There is a connection within our appearances which gives us the means of successfully predicting future appearances."

80. Cf. A 512: "When we say that bodies exist, we mean that there exist certain consistent sensations, having a particular constant cause."

81. Descartes, *Principles of Philosophy,* IV, 205.

82. See H. Lestienne, ed., *Leibniz: Discours de Métaphysique* (Paris: Vrin, 1952), secs. 34–35. See also the translations of these passages in R. N. D. Martin and Stuart Brown, eds., *G. W. Leibniz: Discourse on Metaphysics and Related Writings* (Manchester: Manchester University Press, 1988).

83. Substances as substantial forms: e.g., draft of a letter to Arnauld, Dec. ? 1686 (GP II, 72); *Considerations sur les Principes de Vie,* 1705 (GP VI, 539). Substances as involving substantial forms: e.g., *De ipsa Natura,* 1698 (GP IV, 511–12); *Théodicée,* 1710, sec. 87 (GP VI, 149).

84. This is implied by the fact that substantial forms are introduced in the *Discours de Métaphysique* (sec. 10) immediately after the assertion that a substance "expresses . . . everything that happens in the universe, past, present, and future" (sec. 9).

85. E.g., to Arnauld, 14 July 1686 (GP II, 58); *Primae Veritates,* 1689? (C 523); *Système Nouveau,* 1695 (GP IV, 478).

86. *Discours de Métaphysique,* 1686, sec. 12 (GP IV, 436); to Arnauld, 14 July 1686 (GP II, 58).

87. I have discussed this thesis in my *Logic and Reality in Leibniz's Metaphysics,* pp. 129–37.

88. Very distant indeed, in that the mature Leibniz rejected the theory of material atoms. His views on this topic will be discussed in Section 8.

89. The two papers are A 393 (18 March 1676) and A 491 (1 April 1676). A 521, which cannot be dated more precisely than April 1676, may also precede the paper of 15 April.

90. On this theory, see J. W. N. Watkins, *Hobbes' System of Ideas* (London: Hutchinson, 2nd ed., 1973), pp. 87–94, and Daniel Garber, "Motion and Metaphysics in the Young Leibniz," in Michael Hooker, ed., *Leibniz: Critical and Interpretive Essays* (Minneapolis: University of Minnesota Press, 1982), pp. 168–78.

91. Anthony Quinton, "Spaces and Times," *Philosophy* 37 (1962), pp. 130–47. Also contained in Quinton, *Thoughts and Thinkers* (London: Duckworth, 1982), pp. 108–22.

92. To render the noun "immensitas" and the related adjective "immensus" as "immensity" and "immense" respectively could be misleading. In modern English, "immense" can mean "very large"; for Leibniz, on the other hand, God is not so much a very large being, as one which cannot be measured. (Hence he says, A 475, that the term is equivalent to the term "infinite"). For this reason, the words are rendered here as "immeasurability" or "immeasurable."

93. A 520, April 1676? On God's immeasurability, see also A 391–92 (18 March 1676) and A 523 (April 1676); see also to Clarke, Paper 5, Aug. 1716, sec. 45.

94. Cf. a later paper (A 587, Dec. 1676), in which extension is called "something most simple," which suggests that it is a perfection.

95. Cf. A 391 (18 March 1676): what persists through changes in space is the immeasurability of God.

96. On the nature of space, cf. A 484 (early 1676?).

97. Cf. A 391 (18 March 1676).

98. It should be added that Leibniz had argued for the infinity of space in a paper about the nature of corporeal things (second half of 1671?). There (A VI.2, 307) his argument was simply that we can always conceive other limits of space if we wish.

99. The *De Summa Rerum* offers other arguments for distinguishing matter from space. Leibniz asserts (on grounds that do not concern us here; but see A 524) that the fundamental particles of matter must be spherical; now, however many spheres there may be, they do not fill a whole (A 526, early ? 1676). Another, later argument, which Leibniz declared to be the best proof (A 585, 12 Dec. 1676) rests on the fact that bodies are impenetrable, and that from a mere consideration of length, breadth, and depth one cannot derive the notion of impenetrability.

100. This is not to say that Leibniz failed to discuss the problem during the period in which he was writing the *De Summa Rerum;* on the contrary, a detailed discussion is to be found in *Pacidius Philalethi* (29 Oct.–10 Nov. 1676), A 553–56.

101. The ephemerids are insects of the mayfly family. Late in 1675 Tschirnhaus drew Leibniz's attention to Swammerdam's book on the mayfly, *Ephemeri vita* (1675). (See A 380).

102. This dialogue is mentioned in a letter to Remond of 29 July 1715 (GP III, 648). The work itself refers (GP VI, 588) to the publication in the *Mémoires de Trévoux* of 1712 of a correspondence between Leibniz and Hartshoeker.

103. On duration and time, see also to de Volder, 3 July 1699 (GP II, 183) and Remarks on Descartes, May 1702 (GP IV, 394).

104. The ambiguity was not new with him, but was to be found in standard theological writings. See, e.g., A. J. Kenny, *The God of the Philosophers* (Oxford: Clarendon Press, 1979), pp. 38–48.

105. See also some notes of 22 March 1676: "Absolute existence is eternity or necessity" (A 396).

106. This is perhaps an anticipation of his view, stated much later, that "where time is concerned, only instants exist" (to de Volder, 11 Oct. 1705 [GP II, 279]).

107. This seems to be what is meant by "two momentary states, between which nothing has been interposed."

108. For Leibniz's acceptance of atomism before the period of the *De Summa Rerum*, see, e.g., *Confessio Naturae contra Atheistas*, 1669 (A VI.1, 491–92; GP IV, 108–09); *Hypothesis de Systemate Mundi*, 1671 (A VI.2, 293–94. See also Daniel Garber, article cited in note 90, pp. 160–67.

109. In one passage Leibniz seems to try to reconcile the existence of a vacuum with the existence of a plenum, saying (A 473, 11 Feb. 1676) that a metaphysical vacuum is not inconsistent with a physical plenum. Perhaps this means that as far as science is concerned there is no vacuum, but that for metaphysics, there is. If this is his argument, then it must be said that it is contrary to his later views, according to which there really is no vacuum.

110. This is not the only argument for this conclusion offered in the *De Summa Rerum*. In a note of December 1676 Leibniz argues that the existence of the actual infinite follows from "the conservation of impetus." For Leibniz's defence of conservation laws, see Section 9, pp. xlii–xliv.

111. Leibniz also argues that "all things are full" on the basis of the principle that "the entire effect must be equipollent to the full cause" (A 400, Dec. 1676). This principle will be discussed in Section 9.

112. In the same postscript, Leibniz uses the principle of sufficient reason to argue against the existence of atoms, asking what reason there can be for limiting nature in the process of subdivision. (Cf. *Primae Veritates*, 1689? [C 522]); *Specimen Inventorum*, 1686–95 [GP VII, 317]). Such an argument does not seem to be present in the *De Summa Rerum*, but it is to be found in *Pacidius Philalethi*, from the same period (A 561).

113. Cf. to Arnauld, 23 March 1690 (GP II, 138); to Clarke, Paper 2, Nov. 1715 (GP VII, 356).

114. In sec. 65 of the *Monadology*, 1714, Leibniz argues that each particle of matter is actually subdivided without limit, because only in this way is it possible for each portion to express the whole universe. On the concept of expression, and its presence in the *De Summa Rerum*, see Section 9, pp. xli–xlii. Leibniz could also have used in the *De Summa Rerum* a later argument against the vacuum, based on the principle of the identity of indiscernibles. (On this principle in the *De Summa Rerum*, see Section 6, p. xxxii). The argument is that "The diverse parts of an empty space . . . could not be distinguished from one another, and so they would differ in number alone, which is absurd" (*Primae Veritates*, 1689? [C 521] Cf. the Preface to the *Nouveaux Essais*, 1703–04 [A VI.6, 57; GP V 52]).

115. *Théodicée*, 1710, sec. 14 (GP VI, 110); *Specimen Inventorum*, 1686–95 (GP VII, 316); *Nouveaux Essais*, 3.6.12.

116. *Considerations sur les Principes de Vie*, 1705 (GP VI, 543, 548); to R. C. Wagner, June 1710 (GP VII, 531).

117. *Primae Veritates* (C 520). Cf. a paper on the identity of indiscernibles, after 1686 (C 8); *Specimen Inventorum* (GP VII, 311); to de Volder, April 1702 (GP II, 240); *Nouveaux Essais*, 2.25.5.

118. A 301. Cf. note 4 to No. 14.

119. Leibniz sometimes regards this as following from his theory of the nature of truth (*Primae Veritates*, C 520) and sometimes from his view about the completeness of the concept of a substance, which he also derives from this theory (*Specimen Inventorum*, GP VII, 311).

120. See, e.g., *Conspectus Libelli Elementorum Physicae*, 1678–82 (VE Fasc. 3, p. 651); *Specimen Dynamicum*, 1695 (GM VI, 241, 245); to des Billettes, 21 Oct. 1697 (GP VII, 455); *Théodicée*, 1710, sec. 346 (GP VI, 319); *Principes de la Nature et de la Grâce*, 1714, sec. 11 (GP VI, 603).

121. The consequence of which Leibniz speaks here must be a logical consequence; he has already said that the state in question follows in respect of time.

122. Cf. p. 119, n. 29, in which this passage is quoted.

123. In the same paper, Leibniz derives the conservation of matter from the

conservation of the quantity of motion, together with the assumption of the plenitude of things (A 469: "The motion of a body is expansion . . . "). This argument seems to be peculiar to this paper.

124. The best-known passage is probably sec. 17 of the *Discours de Métaphysique*, written early in 1686.

125. E. Hochstetter, "Von der Wahren Wirklichkeit bei Leibniz," *Zeitschrift für philosophische Forschung* 20 (1966), p. 428 (also in A. Heinekamp and F. Schupp, work cited in note 15, p. 460); Michel Fichant, *Studia Leibnitiana Supplementa* 13 (1974), pp. 196–97.

126. This is implied in the passages cited in the last paragraph; see also *Confessio Philosophi*, autumn 1672–winter 1672–73? (A 116): "The nature of the mind is to think."

127. On the thesis that thought is not motion, cf. a paper of December 1676 (A 586–87).

128. The necessary being is also said to act on itself (A 587), which leads to the question whether God, too, acts from reflection. Perhaps he may be said to do so, in that in his creation of the universe he considers various alternatives and chooses the best.

129. From the Paris period, see *Confessio Philosophi*, (A 135). Before the period: *De Vi Persuadendi. De Somnio et Vigilia*, 1669–summer 1670? (A VI.2, 276); *Demonstratio Propositionum Primarum*, autumn 1671–early 1672? (A VI.2, 482); *Wilhelmus Pacidius*, 2nd half of 1671–early 1672? (A VI.2, 511). After the Paris period: *Animadversiones* on Descartes' *Principles*, 1692 (GP VII, 362); *Nouveaux Essais*, 1703–04, 2.21.47.

130. For the date of this paper, see A. Robinet, *Studia Leibnitiana* 1 (1969), p. 87. On the created soul's need of a body, cf. *Théodicée*, 1710, sec. 120 (GP VI, 172), and to de Volder, 20 June 1703 (GP II, 253).

131. To Arnauld, 9 Oct. 1687 (GP II, 112). Cf. *Discours de Métaphysique*, 1686, sec. 14.

132. If the only substances are minds, then this will be equivalent to saying that every substance perceives everything that happens in the entire world. But there is no hint of phenomenalism in the paper in question.

133. References as in note 131; see also Section 9, p. xlii.

134. Cf. to Arnauld, 30 April 1687 (GP II, 91); 9 Oct. 1687 (GP II, 113).

135. Alternatively, he could appeal to the principle of sufficient reason, and say that there is no reason why the effects should ever come to an end. Compare an analogous argument in the *Primae Veritates*, 1689? (C 523): given that corporeal substance once endures, it will always endure, for there is no reason for a change.

136. He does not explain in the *De Summa Rerum* why this should be so. Later (*Discours de Métaphysique*, sec. 35; *Monadology*, secs. 83–84; *Principes de la Nature et de la Grâce*, sec. 15), he says that it is by virtue of their rationality that minds have an especially close relation to God. Such an argument is quite consistent with Leibniz's thought in the *De Summa Rerum*.

137. Cf. A 477: "Whoever understands these things correctly . . . ."

138. Leibniz does not say that God's grace consists in endowing us with a *good*

will. He seems to mean that God's grace consists in his endowing us with a *will*—a will that is free.

139. To Clarke, Paper 1, Nov. 1715, sec. 4. Cf. Paper 2, Nov. 1715, secs. 8–9, 12; Paper 3, Feb. 1716, sec. 16.

140. *Système Nouveau*, 1695 (GP IV, 483); to Basnage de Beauval, 13 Jan. 1696 (GP IV, 499).

141. One may mention Martial Gueroult, *Leibniz: Dynamique et métaphysique* (Paris: Aubier, 2nd ed., 1967) and Gerd Buchdahl, *Metaphysics and the Philosophy of Science* (Oxford: Blackwell, 1969), pp. 388–469.

142. How far back it can be traced has still to be determined. But it seems that an important part in the development of Leibniz's theory of truth as inclusion is played by a series of logical papers written in April 1679. (See especially *Elementa Calculi*, C 51; *Calculi Universalis Investigationes*, C 67; *Calculus Consequentiarum*, C 85. On the date of the last-named, see VE Fasc. 7, p. 1537). In these passages, Leibniz asserts that to say that a proposition is true is to say that the concept of the predicate is in that of the subject. From this it is a short step to saying that a proposition is true when the concept of the predicate is in that of the subject.

1. On Mind, the Universe, and God

1. The date was probably added by Leibniz later. The paper appears to have been written in the second half of the month in that it is followed, on the same sheet, by an excerpt from a letter to Oldenburg of 28 Dec. 1675.

2. Published in 1668.

3. The context shows that Leibniz has in mind any kind of rational procedure. Cf. *Pacidius Philalethi*, 29 Oct.–10 Nov. 1676 (A 529), which speaks of "proceeding" from the known to the unknown.

4. For other statements of the same view, see Introduction, Section 2, p. xvi, and notes 29–32.

5. A requisite is "that which, if it is not given, the thing does not exist": *Demonstratio propositionum primarum*, late 1671–early 1672? (A VI.2, 483). See also *Confessio Philosophi*, autumn 1672–winter 1672–73? (A 133).

6. Leibniz takes up this point in a dialogue about truth and symbols written in August 1677, in which he notes that (e.g.) the symbol 0 has no similarity with nothing, or the symbol *a* with a line (GP VII, 192). In this respect, then, a definition differs from a "sensible image."

7. The text has "magis"; but Leibniz surely meant to write "majus."

8. Leibniz may have in mind reasoning of a kind which he was to use later in *Pacidius Philalethi*. Suppose a wheel to rotate with the most rapid motion; prolong its radius outside the circumference and take any point on that prolongation; then that point will rotate more rapidly than a point on the rim of the wheel (A 551–52).

9. Later, Leibniz thought that this can be proved, and he attacked Descartes for saying that matter assumes successively all the forms of which it is capable (Descartes, *Principia Philosophiae*, III, 47). See, e.g., letters to Christian Philipp, Nov. 1679 (GP IV, 281–82) and Jan. 1680 (GP IV, 283–84); also *De Libertate*, 1689? (Foucher de Careil, p. 179).

10. Compare, from a paper written after 1676, "That which implies a contradiction, or, whose opposite is necessary, is called "impossible" (*De Necessitate et contingentia,* C 17. The date of this paper has not yet been determined precisely: VE Fasc. 3, p. 455).

11. Cf. *Confessio Philosophi,* A 128–29.

12. "Common notions" are axioms. The term goes back to the Greeks; e.g., the axioms of Euclid are called *koinai ennoai,* "common notions." Later (No. 10 below, 15 April 1676; A 508) Leibniz was to answer his question by saying that the proposition "I have such and such appearances" is a primary truth.

13. Questions about the mid-point of infinity were taken up by Leibniz later in his stay in Paris. See *Linea interminata,* April 1676 (A 486–87) (not translated in this volume).

14. Perhaps the "given straight line" is understood to be an *infinite* straight line.

15. Perhaps because the world is surrounded in all directions by an infinity of space, and each infinite distance is equal to any other infinite distance.

16. Taking "hinc absit" to be presupposed in the clause beginning "et medium."

2. On Matter, Motion, Minima, and the Continuum

1. The editors of the Academy Edition point out that before writing these notes, Leibniz must have read the first two parts of Descartes' *Principia Philosophiae* (cf. A 213–17: winter 1675–76–early 1676?).

2. From the context, it emerges that Leibniz does not mean that to *exist* is to be capable of being perceived; he is referring to being *such and such.*

3. Leibniz was to develop this argument in the last year of his life, in the course of his controversy with Clarke: To Clarke, Paper 5, Aug. 1716, sec. 29 (GP VII, 395).

4. Literally, "the extended."

5. Cf. *Pacidius Philalethi,* 29 Oct.–10 Nov. 1676 (A 554–55).

6. "Implicare" here stands for "implicare contradictionem"; cf. A 489.

7. Perhaps a reference to Descartes' argument for the existence of "subtle matter," *Principia Philosophiae,* III, 47.

8. The editors of the Academy Edition refer to Galileo, *Discorsi,* III; Descartes, *Principia Philosophiae,* II, 367–37; Hobbes, *De Corpore,* II, 8, 18–19, and III, 15, 1; Archimedes, *De Spiralibus.*

9. *Principia Philosophiae,* II, 36–37.

10. Literally, "of the things of God."

11. A reference to the argument of the first paragraph.

12. Contrast the preceding paper, A 463: "'Impossible" is a two-fold concept. . . ."

13. The argument seems to be that if one part of a body first moves more quickly, it must then move more slowly to preserve the same quantity of motion, and this means that it must become heavier.

14. The point is that if it were less than or equal to a minimum, it would be one of that group of minima which have already been assumed to have been taken away.

15. That is, it is not the case that minima are *in* the continuum, or are *parts* of it.

16. Leibniz seems to be thinking of a body which moves without stopping, and so will go outside the boundaries of the universe.

3. On the Secrets of the Sublime, or on the Supreme Being

1. On this argument, cf. Introduction, Section 3, p. xx.

2. That is, has the other attributes of God.

3. A provisional title for the work that Leibniz has in mind. For the translation of "summa rerum" as "supreme being," cf. Introduction, Section 1, p. xiii. It is probable that Leibniz had used this phrase in the same way previously, namely, in the Preface to an edition of Nizolius (1670). There, (A VI.2, 429; GP IV, 159) he equates what he calls "pietas naturalis" with the "scientia de summa rerum"; this is then equated with metaphysics, which is in turn equated with theology.

4. On these "small spheres" cf. A 30–34, 39–42, 52–53, 61–62, 70–71. A "terrella" ("little earth") is in fact a globule; Leibniz may use this word in preference to "globulus" because he rejects what Descartes says about "globuli" (A 24–25, 33).

This passage contains the first of several references in the *De Summa Rerum* to vortices (cf. A 393, 474, 477, 480, 509, 518, 525). The idea that the physical universe is a plenum, consisting of an aether in which there are solid bodies which are carried around by its rotation, was a fundamental one in Leibniz's physics. As early as his *Hypothesis Physica Nova* (1671), Leibniz was explaining the motion of the earth (A VI.2, 426), together with gravity and elasticity (A VI.2, 227, 249) by reference to the circulation of the aether. Such a circulation is reminiscent of Descartes' theory of vortices, but in fact the *Hypothesis Physica Nova* was inspired by Leibniz's study of Hobbes (A VI.2, xxxi–ii, 219–20). Leibniz continued to find the concept of a vortex fruitful, using it to explain the motion of the planets in his *Tentamen de motuum coelestium causis*, published in Feb. 1689 (GM VI, 144–61).

In the *De Summa Rerum* Leibniz distinguishes between a "general infinite vortex" (A 474; cf. A 480) and particular vortices, saying (A 393, 509, 525) that there are as many vortices as solid bodies. This takes up a distinction which he drew previously between a universal and a particular gyration ("gyrus"): cf. *Summa Hypotheseos Physicae Novae* (second half of 1671?, A VI.2, 365–67) and *Propositiones quaedam physicae* (early 1672–autumn 1672?. A 29–31). The present passage (A 473) clearly refers to the formation of a particular vortex. (See also note 22 below, on A 477).

5. Perhaps the argument is that if a metaphysical vacuum is less than any assignable size it is unobservable, and physicists may therefore proceed on the assumption that it does not exist.

6. In classical Latin, "caementum" means rubble or stone chips; here, however, Leibniz uses it to mean what would now be called "cement." Cf. C 467, from a list of definitions of c. 1702–04.

7. Compare A 473, "A note in passing. . . ."

8. Compare A 465 above.

9. Compare note 5, No. 1 above.

10. The Latin phrase comes from the Nicene Creed, where it refers to Jesus Christ. Leibniz presumably means by it that God is self-caused, *causa sui*.

11. Leibniz seems to be suggesting that nature can be described without the use of irrational numbers; see the reference to a circle which follows.

12. The reference is to B. Cavalieri, *Geometria indivisibilibus continuorum nova quadam ratione promota*, 1st ed., 1635. See also A VI.2, 265.

13. The reference is to the *Tractatus theologicus de Deo* (1610) of Conrad von dem Vorst (1569–1622), an Arminian theologian who was convicted of heresy at the synod of Dort (1618–19).

14. A reference to a book by Liber Froimond, *Labyrinthus de compositione continui* (1631). Leibniz cites the book as early as 1671 (A II.1, 111). See also, e.g., *Discours de Métaphysique*, 1686, sec. 10 (GP IV, 435). Leibniz recognises another "famous labyrinth," that of freedom and necessity; cf. *Théodicée*, 1710, Preface (GP VI, 29).

15. Cf. a paper of late 1672 or early 1673, *De minimo et maximo. De corporibus et mentibus*. Here (A 99) Leibniz argues that 'One point can be infinitely less than another. For an angle of contact is a point, and a rectilinear angle is a point; yet a rectilinear angle, however small, is greater than any angle of contact." On the problem of the angle of contact, see E. de Olaso, "Scepticism and the infinite," in A. Lamarra, ed., *L'Infinito in Leibniz* (Rome: Ateneo, 1990), pp. 103–13.

16. The concept of the immeasurability (*immensitas*) of God is discussed by Leibniz later; see especially his notes of March 1676, A 391 (No. 7 below). On the distinction between the infinite and the unlimited, see also Leibniz's notes on a letter of Spinoza, Feb. ? 1676 (A 281, note 24).

17. This is denied by Leibniz at the end of the paper (A 477).

18. Sc. all possibles taken as forming a whole.

19. Leibniz seems to imply that no one can think of all possibles. Cf. note 18.

20. Compare the distinction between the infinite and the unlimited drawn in A 475. For Leibniz's later views on eternal damnation, cf. *Théodicée*, secs. 266–72 (GP VI, 275–80).

21. Leibniz means that this cannot be said of absolutely all minds; more specifically, it cannot be said of the minds of the wise.

22. The line of thought in this paragraph seems to be as follows. The assertion that for every mind there is a vortex (on which, cf. A 393) can be seen as following from the statement that every mind is implanted in matter, taken with the statement, made earlier in this paper, that solid bodies produce vortices by their motion (sc. in the aether). (A 473; cf. A 393. See also A 509, 525: there are as many vortices as solid bodies.) In referring to "the intelligences" Leibniz doubtless has in mind the planetary intelligences of Aristotelian theory. The obstacle mentioned is perhaps the difficulty of ascribing minds to the planets, in view of the fact that their motion seems to lack the degree of freedom that minds must have. Leibniz's reply seems to be that in so far as the planetary intelligences understand what they are obliged to do and (as members of a system) communicate with God, they will not want to move in an erratic way. Leibniz's next point—that there are minds

everywhere—is discussed in Section 6 of the Introduction, which considers his thesis that for every material thing there must be a mind.

23. Leibniz seems to be suggesting that the number one is the mathematical analogue of God. Later, Leibniz was to express creation by the analogy of the binary system of numerals, saying that just as all numbers can be represented in terms of 1 and 0, so everything follows from God and nothing. See *De Organo sive Arte Magna Cogitandi,* 1679–82? (C 430–31; dated VE Fasc. 5, p. 1053); *Vindicatio justitiae divinae,* 1686? (Grua, 371; dated VE Fasc. 1, p. 46); *Dialogue effectif sur la liberté de l'homme,* 25 Jan. 1695 (Grua, 364); letter to Morell, 14 May 1698 (Grua, 126).

4. On the Seat of the Soul

1. The reference is to Johann Friedrich, Duke of Brunswick-Lüneburg.

2. Johann Christian, Baron von Boineburg, in whose service Leibniz went to Paris. See Leibniz's letter to Johann Friedrich, 21 May 1671 (A II.1, 108).

3. This paper, *De Resurrectione Corporum,* is printed as an appendix to the above letter (A II.1, 115–17).

4. Christian Knorr von Rosenroth, a Cabbalist and alchemist.

5. The full title is: *Some physico-theological considerations about the possibility of the resurrection.* The work is reprinted in M. A. Stewart, ed., *Selected Philosophical Papers of Robert Boyle* (Manchester: Manchester University Press, 1979), pp. 192–98. Leibniz's notes on the book (Dec. 1675–first half ? of Feb. 1676) are published in A 237–41.

6. Cf. *De Incarnatione Dei seu de Unione Hypostatica,* 1669–70? (A VI.1, 533). Leibniz states that the soul is not united with all the corpuscles of the body, but inheres in the centre of the cerebrum, "in a kind of flower of substance, fixed and inseparable," and is substantially united in such a way that it is not separated by death. On the "flower of substance," see also Leibniz's notes on Boyle, A 238.

7. Cf. *De Resurrectione Corporum,* A II.1, 117: "The Jews say that the soul remains, unconquered by anything that happens, in a little bone which they call 'Luz,' together with the flower of substance." See also *Specimen Quaestionum Philosophicarum,* 1669 ed. (A VI.1, 91) and to Arnauld, 30 April 1687 (GP II, 100). Earlier, in a letter to Johann Friedrich of 21 May 1671, Leibniz had spoken of a "kernel" (*Kern*) which remains when the rest of the body is destroyed (A II.1, 108–09; GP I, 153).

8. Cf. Boyle, op. cit., ed., Stewart, p. 198.

9. P. Borel, *De Vero Telescopii Inventore . . . Accessit etiam Centuria observationum microscopicarum,* 1655.

10. This appears to be the sense of this phrase. But in place of the genitive of "fructus" ("fructūs") Leibniz wrote the dative, "fructui."

11. On "plastic power," see Boyle, op. cit., pp. 80, 144, 195–96.

12. Jakob Degen ("Scheckius": 1511–87) was the author of *De plastica seminis facultate libri tres,* 1580. William Davidson ("Davissonus": fl. 1635–60) was a Scottish alchemist who resided in Paris for many years.

13. Leibniz got to know the mathematician Claude Perrault during his stay in

Paris; here, he seems to have knowledge of some unpublished work by Perrault. See also the next paper (No. 5).

14. Cf. note 8 above.

15. Boyle, op. cit., p. 196, refers to "chemical experiments by which Kircherus, a Polonian physician in Quercetanus, and others, are affirmed to have by a gentle heat been able to reproduce, in well-closed vials, the perfect ideas of plants destroyed by the fire."

5. On the Union of the Soul and Body

1. This is dated by the reference to Perrault in the preceding paper.

2. This term means the organ of sensation: cf. to Clarke, Paper 2, Nov. 1715, sec. 3 (GP VII, 356).

3. Leibniz means (as the next sentence makes clear) *at the same time.*

4. Leibniz is referring to "impressed species," i.e., what is impressed on the mind by an object which is perceived or understood. Cf. *Discours de Métaphysique,* 1686, sec. 26 (GP IV, 451).

5. This takes "Deo" to be in the dative case. If it is in the ablative, then the phrase will mean "The whole world is one vortex in God." But such a pantheistic view does not seem typical of Leibniz—though it must be noted that in a paper of 15 April 1676 (No. 10 below, A 512), creatures are said to be related to God as parts to whole.

6. On Magnitude

1. The date suggested rests on affinities with other metaphysical discussions of early 1676.

2. Leibniz seems to want a term to stand for the negative of "merit"; his difficulty springs from the fact that, in classical Latin, "demereo" means to earn duly or to deserve.

3. The text has "multatum" ("punished"), but "mutilatum" gives better sense.

4. The Academy Edition lists the following references: to Jakob Thomasius, 30 April 1669 (A II.1, 22); to Chapelain (?), first half of 1670? (A II.1, 50); *De Natura Rerum Corporearum,* second half of 1671? (A VI.2, 304); On Marius Nizolius, early 1670 (A VI.2, 441).

5. Literally, "will be its three-footedness."

6. This proof is given in full in an earlier paper, *Demonstratio Propositionum Primarum,* autumn 1671–early 1672? (A VI.2, 482–83).

7. Compare a table of definitions, second half of 1671–early 1672? (A VI.2, 498): "A *rule* is an instrument which determines the shape of a motion whilst its application to space lasts. A pair of compasses, therefore, is not a rule. Some circle or solid ring would be a rule, if someone were to use it in describing a circle."

8. Leibniz was to return to the topic in his *Meditationes de Cognitione, Veritate et Ideis,* 1684. See his discussion of color in this paper, GP IV, 422–23.

9. Later, Leibniz was to say that *space* is an order of co-existence, whereas time is an order of succession: see, e.g., to des Bosses, 16 June 1712 (GP II, 450). But perhaps his point in the present passage is that if we are to say, for example, that

an insect lives for a day, then we must regard the birth of the insect as (say) simultaneous with daybreak and its death as (say) simultaneous with sunset.

10. Perhaps this is a reference to Descartes, *Principia Philosophiae*, II, 11, which asserts that there is no real distinction between space and corporeal substance.

7. Excerpts from Notes on Science and Metaphysics

1. *De Anima*, III, 5.

2. The Academy Edition refers to *De Principio Individui*, 1663, secs. 15, 25 (A VI.1, 15, 18).

3. Probably a reference to Vorst; cf. No. 3 above, A 475.

4. This definition plays an important part in Leibniz's proof of the possibility of God. See No. 7 below (A 395), and Nos. 18 (A 575, 577) and 19 (A 578).

5. Note the use of the principle of sufficient reason.

6. See what is said about the "flower of substance" in No. 4 above (A 478).

7. Compare what is said about the "cement of matter" in No. 3 above (A 473).

8. *insecabilis*—literally "uncuttable"—is related to the Greek *atomos*. See also A 524.

9. Presumably the endeavours of the rest of the universe, which impinge on the mind and the body.

10. A reference to Malpighi, whose microscopic observations on the foetus of the chick led him to believe that the foetus was "pre-formed" in the unfertilised egg. Malpighi's observations were published in his *De formatione bulli in ovo*, 1673. Leibniz brings the same argument against the transmigration of souls in his *Système Nouveau*, 1695 (GP IV, 480).

11. The reference is to Aquinas, *Super IV libros sententiarum*, II, d.3, q.1 ad 4, and d.32, q.2 ad 3.

12. From the context, it appears that the adjective "verus" means "true" in the sense of "genuine."

13. Leibniz may mean that a self-contradictory proposition cannot strictly speaking be *thought;* it can only be said or written.

8. A Meditation on the Principle of the Individual

1. Most of the titles of the pieces contained in this volume have been provided by the editors of the Academy Edition. In the present case, however (and also in the case of Nos. 16, 19, 21, and 22) the title is Leibniz's.

2. It is noteworthy that Leibniz is arguing here from something's being true of X, to X's always having had an appropriate quality—a line of argument which he was to develop on the *Discours de Métaphysique*, 1686, and related works.

9. On the Elements of Thinking

1. Because of the way in which the paper on which this was written is divided, it can be inferred that the piece follows No. 8 above (1 April 1676) and precedes *De Motu et Materia* (A, No. 68: not translated here) which Leibniz laid aside on 10 April.

2. Word nearly illegible.

3. Cf. No. 10, A 509. For a later statement of the same view, see *Introductio ad Encyclopaediam arcanam,* 1678–86? (C 513; VE Fasc. 4, p. 869). I have discussed this view in the Introduction to my *Leibniz: Logical Papers* (Oxford: Clarendon Press, 1966), pp. xxvii–viii. See also a German translation of a revised version of this Introduction, in A. Heinekamp and F. Schupp, eds., *Leibniz' Logik und Metaphysik* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1988), pp. 262–63.

4. Cf. A 506 below: these are there distinguished as "absolute" and "hypothetical" identical propositions.

5. Cf. No. 7 above, A 396: "when a certain meaning of words has been assigned. . . ."

6. Leibniz proceeds to re-open the discussion of definitions, propositions, proof, reasoning, conviction, and demonstration.

7. Literally, "is a convincing."

8. "Demonstrate" here has a stronger sense than "prove." A "proof" is based merely on what is granted, and its conclusion may or may not be a true proposition, depending on the truth or falsity of the premises. A "demonstration" is based on what ought to be granted, and its conclusion will be true.

9. That is, to continue the list of propositions which are to be granted.

10. On Truths, the Mind, God, and the Universe

1. This is an awkward phrase; one might expect instead "I have such and such perceptions" or "such and such sensations." (Compare what is said at the end of No. 9, A 507: "I am conscious of this or that, namely that which I sense".) Perhaps Leibniz is saying that that of which I am conscious is not just a sensation, but is an *appearance of* something.

2. There may be an echo here of a conversation which Leibniz had with Tschirnhaus about Spinoza's *Ethics* early in 1676. Tschirnhaus told Leibniz that, according to Spinoza, the scholastics started from created things, Descartes started from the mind, but that he (Spinoza) started from God (A 385).

3. Descartes, *Meditation* III.

4. Sc. in favour of the accuracy of the calculation.

5. A reference to the rules of method contained in Part II of Descartes' *Discours de la méthode.*

6. Cf. No. 9, A 504.

7. Compare what is said about the state of mind at death in *Confessio Philosophi* (A 119, 138–39), where Leibniz instances someone who dies hating God.

8. Leibniz probably has in mind Spinoza's view that the mind is the idea of the body (cf. conversation with Tschirnhaus, A 385), and takes this to mean that the mind will perish when the body perishes.

9. Cf. Spinoza, *Ethics* V, Prop. 23.

10. *Summa contra Gentiles,* I, 10.

11. *Summa contra Gentiles,* I, 11.

12. For Leibniz's views about rules, compare No. 6 above, A 483.

13. Leibniz has in mind the Aristotelean doctrine of the active intellect, especially as interpreted by the Averroists.

14. Descartes, *Principia Philosophiae*, II, 54–55: hard bodies are those, all the particles of which are at rest in relation to one another, and there is no glue which binds them together, apart from the fact that they are at rest. Perhaps Leibniz means that if (as he has suggested) each body is divided into others, then these bodies could be at rest in relation to each other.

11. On Forms, or, the Attributes of God

1. This piece is written on the same sheet of paper as the conclusion of A, No. 65 (*Linea Interminata*), which is dated "April 1676."

2. Leibniz is here taking "image" in the sense of a bodily trace, of the kind just mentioned. Cf. Descartes, *Optics*, Discourse 4, and Spinoza, *Ethics* II, Prop. 17 Schol.

3. Cf. No. 13 below, A 520: motion is "the transference of a certain thing in a certain time."

4. Cf. No. 6 above, A 482.

5. Cf. *Demonstratio propositionum primarum*, autumn 1671–early 1672? (A VI.2, 483).

12. On Reminiscence and on the Mind's Self-reflection

1. This piece follows No. 11, on the same sheet of paper.

2. In fact the author was Augustinus Oregius. The book is *Aristotelis vera de rationalis animae immortalitate sententia*, 2nd ed., 1630.

3. Maffeo Barberini (1568–1644) was pope from 1623. He was appointed cardinal in 1606.

4. Sc. and memory does not exist without images, i.e., bodily "traces." Cf. No. 11 above, A 514.

5. Leibniz was to say later, in the *Discours de Métaphysique*, 1686, sec. 14 (GP IV, 439) that "all our phenomena . . . are only consequences of our being." But each substance is created and conserved by God, who is therefore in a sense the sole "cause of his own perceptions."

6. Compare the attack on Spinoza's theory of the mind, No. 10 above, A 510.

7. This assumes that Leibniz intended to write, not just "cogitationes," but "per cogitationes."

8. See *De Corpore*, Chap. 25, sec. 1.

13. On the Origin of Things from Forms

1. This is written on two sides of the same sheet of paper as No. 14 below, which takes up the same themes.

2. Leibniz is saying in effect that ideas form a species of the genus of thoughts. Compare his notes, made early in 1676, on Foucher's *Réponse* to Malebranche's *Recherche de la vérité* (A 314).

3. Perhaps a reference to Spinoza, *Ethics* II, Prop. 13.

4. Cf. No. 11 above, A 513: "Thought was both a subject and an object."

5. The Latin verb "micare" (sc. "digitis") means to raise one's fingers suddenly for someone else to guess. Leibniz seems to be relating *micatio*, the sensation of something flickering, to a physical activity of this sort.

6. Literally, "the absolute extended."

7. Taking "ipsa" to refer to "basis," used in the preceding sentence.

8. The phrase "quod vocant" indicates that Leibniz is using a standard technical term. Compare Gassendi (whose philosophy Leibniz had studied in his youth), *Syntagma Philosophicum*, 1658, II.1: "That space which is generally called imaginary and which the majority of sacred doctors admit exists beyond the universe" (trans., C. Brush, *The Selected Works of Pierre Gassendi* (New York: Johnson reprint, 1972), p. 389. See also a late letter of Leibniz to Remond, 27 March 1716 (GP III, 674): "For that reason the ancients were right in calling a space outside the world, that is, space without bodies, imaginary."

9. On this, cf. A 475 and 484 above.

10. Cf., e.g., A 578.

11. Cf. No. 11 above, A 514: the essence of God consists in the fact that he is the "subject of all compatible attributes," and an attribute of God is "any simple form." On essence as an aggregate, cf. No. 17 below, A 573.

12. Cf. No. 11 above, A 514: "But nothing hinders. . . ."

13. Cf. the definition of "idea" given at the beginning of this paper, A 518.

14. This sentence appears to be unfinished.

15. A use of the principle of sufficient reason.

14. On Simple Forms

1. The date was added later.

2. Presumably perception is meant. Cf. No. 3 above, A 474–75.

3. The text has "3 + 2," which must be a slip.

4. Compare a passage (A 301) from Leibniz's Latin abridgement of Plato's *Theaetetus*, made at about the same time (March–April 1676). Leibniz represents Socrates as saying (*Theaetetus* 155 b–c): "You become bigger by growing; but I, who am now equal to you, remain as I am, and nothing is lost from my bulk. Yet I become smaller than you, as you grow. And this is something wonderful—namely, that I have become something different, without any change in me, contrary to what we have granted; and that I have become less, even though nothing has left me." Leibniz comments: "This difficulty is a notable one, and is of great importance with respect to other matters." On this thesis, cf. Introduction, Section 9, p. xli.

15. On the Plenitude of the World

1. Leibniz added the date later. From their content, these notes must have been written early in the year.

2. Cf. No. 11 above, A 514–15.

3. Cf. No. 14 above, A 523.

4. Leibniz uses this adjective (*insecabilis*) in connection with atoms. Cf. No. 7 above, A 393.

5. The argument seems to be that if there were a plenum but no atoms, then there would be no individual things; there would just be a featureless whole.

6. Perhaps Leibniz means that there is an infinity of atoms.

7. A use of the principle of sufficient reason.

8. Leibniz is probably criticizing Gassendi (cf. *Confessio Naturae contra atheistas*, 1669, A VI.1, 491; GP IV, 108), who revived the Epicurean idea that atoms are joined to each other by hooks (cf. Lucretius, *De Rerum Natura*, II, 394). See also Leibniz's *Theoria Motus Abstracti*, 1671 (A VI.2, 274; GP IV, 239).

9. A use of the principle of harmony. See also A 526, "This seems to me to be most beautiful. . . ."

10. This may mean that there are fewer such globes in a given space than before. Leibniz seems to be explaining the way in which a number of large bodies are connected by saying that they cannot move apart without moving the bodies which surround them. This is not to say that there no gaps between the large bodies; but these can be filled only by very small bodies.

11. Presumably "mundane"—i.e., bodies which are on our earth—as opposed to "extramundane."

12. Literally, "all directions."

16. Guilielmus Pacidius on the Secrets of Things

1. "Guilielmus" is the standard Latin form of Leibniz's second name, Wilhelm. The name "Pacidius" appears to have been invented by Leibniz himself. It is related to "pax" ("peace") and perhaps also to "dius" or "divus" ("divine"), and so may be a rendering into Latin of the sense of his first name, Gottfried (literally, "peace of God"). However, some scholars take the name to mean "peace-maker" (e.g., A Heinekamp, in E. Stein and A. Heinekamp, eds., *Gottfried Wilhelm Leibniz: Mathematiker, Physiker, Techniker* [Hanover: Schlütersche Verlagsanstalt, 1990], p. 20). Leibniz often used these names: see, e.g., A VI.2, 510 (GP VII, 51); A 528; C 515; GP VII, 49, 54.

2. This programme is related, both in content and in time, to Leibniz's plan for a book on *The Elements of an Arcane Philosophy, Concerning the Supreme Being* (cf. No. 3 above, A 472 note). Leibniz's dialogue *Pacidius Philalethi* may be an attempt to carry out number 7 of the programme.

3. Leibniz's title. This outline of an encyclopedic work is of interest in that it refers to many of the themes discussed in the *De Summa Rerum*, as well as showing the range of Leibniz's interests in the fields of science and technology.

4. Cf. No. 3 above, A 475, and note 14 of No. 3 above.

5. Perhaps meaning a science of medicine which is based on firmly established principles, and is not merely empirical.

6. "Tinctura," like "exaltatio" ("refining") is an alchemical term. Here, it may mean the extraction of the essence of a material being.

7. This part of the manuscript has been heavily corrected. In the course of correction, the number "18" was omitted.

8. Perhaps a reference to Leibniz's "Egyptian plan" (*Consilium Aegyptiacum*) of Dec. 1671 to autumn 1672. The plan was that Louis XIV (described as "Rex christianissimus"—a "most Christian king") should wage war on the Muslims of Egypt. In this way, it was hoped that Louis' aggressive aims would be diverted from Europe. See A IV.1, Nos. 10–18.

17. That a Most Perfect Being is Possible

1. The content of the first part of this paper is related to the proof of the possibility of God contained in the notes of 22 March 1676 (No. 7 above, A 395–96), and the content of the second part relates to Leibniz's reflections on the supreme being (*summa rerum*) of roughly the same period. On the other hand, the paper is also close in respect of content to the version of the ontological argument presented in Spinoza in Nov. 1676 (No. 19 below), and the editors of the Academy edition regard this as the more probable date.

2. A use of the principle of sufficient reason.

3. Literally, "of the extended."

4. The conclusion of the argument is strongly reminiscent of Spinoza. It was perhaps this fact which led Leibniz to abandon the paper after writing a few more lines.

5. The paragraph breaks off at this point and is followed by a note about the way in which metaphysics should be written. Leibniz takes up the question of the definition of attribute, affection, and the like at the end of the paper.

18. A Most Perfect Being Exists

1. The work is written on the same paper as that used for the dialogue *Pacidius Philalethi*, of 29 Oct.–10 Nov. 1676. The last four paragraphs (A 577) are in effect a draft of the paper presented to Spinoza between 18 and 21 Nov. 1676 (No. 19 below).

2. Leibniz presumably means all other *necessary* propositions—i.e., those which are necessary but not indemonstrable.

3. One would not normally say that "A is not B" is an identical proposition. But Leibniz is thinking of cases in which A and B are such that one logically excludes the other—e.g., "Thought is not extension," which Leibniz takes to mean "Thought is not something different from thought."

4. *Theaetetus*, 201e–202a. Cf. Leibniz's Latin summary of this work, March–April 1676 ?, A 309.

5. That is, not just two, which was all that was proved earlier.

6. Leibniz now gives another version of the ontological argument, which starts, not from the concept of a perfection, but from the notion of a necessary being.

7. Leibniz seems here to be using the verb "dari" ("is granted," "is given") to refer to conceptual existence, as opposed to the verb "existere," used to refer to real existence. Cf. A 577, last paragraph.

8. The case of the reciprocal proposition (i.e., a proposition of the form "Every A is B, and every B is A") is discussed more fully towards the end of the paragraph.

9. Leibniz's meaning seems to be this: suppose that B is analyzed as EFG, etc., and suppose that A is defined as EFG. Substituting A for EFG we get, "Every B is AH, etc."

10. Leibniz is presumably thinking of *universal* propositions (as in the last paragraph) and of the fact that, given any universal negative proposition, such as "No A is B," one may also assert "No B is A."

19. That a Most Perfect Being Exists

1. Leibniz presumably wrote down this proof during one of his visits to Spinoza (18–21 Nov. 1676). He later added a note about the occasion ("I showed this argument. . . .") and a Scholium.

2. Leibniz's title.

20. My Principle is: Whatever can Exist and is Compatible with Others, Exists

1. In dating this paper, Leibniz used the Old Style Calendar; for consistency, this has been changed to the New Style in the translation. (Cf. Introduction, p. ix).

2. Compare Leibniz's view (No. 3 above, A 474) that matter is actually subdivided into an infinity of points.

3. Cf. No. 3 above, A 473.

4. For the term "compossible," compare a table of definitions, second half of 1671–early 1672? (A VI.2, 498): "*Compossibles* are those, one of which being given, it does not follow that the other is negated; or, those of which one is possible, the other being assumed."

5. The phrase "cursus rerum" is a classical expression, found in Cicero and Tacitus.

6. An idea for a work which Leibniz did not write. The mature Leibniz rejected the Pythagorean idea of the transmigration of souls and put forward instead the idea of the transformation of one and the same animal: see, e.g., *Système Nouveau,* 1695 (GP IV, 481). He also rejected what he took to be Descartes' idea that the lower animals are mere automata, without souls: e.g., *Système Nouveau,* GP IV, 478.

21. A Definition of God, or, of an Independent Being

1. The date of this paper cannot be determined with any precision. Its content is related to the discussions of the existence of God that begin with the notes on science and metaphysics of 22 March 1676 (A 395) and culminate in the papers written in connection with Leibniz's visit to Spinoza (nos. 17–19 above). On the other hand, the piece could have been written in Hanover, in that (as the editors of the Academy Edition point out) Leibniz used similar paper from 1677.

2. Leibniz's title.

3. Compare a similar remark in the *Specimen Inventorum*, 1686–95? (GP VII, 310) and in an undated paper (VE Fasc. 8, p. 1909), trans., G. H. R. Parkinson, *Studia Leibnitiana* 6 (1974), pp. 26–27.

22. A Chain of Wonderful Demonstrations about the Universe

1. "Summa rerum" seems to mean here "the sum of things," i.e., the universe, rather than "the supreme being," as in No. 3 above. Cf. Introduction, Section 1, p. xiii.

2. Leibniz's title. On the date of this paper, cf. Note 1 to No. 20.

3. A statement of the principles of contradiction and of excluded middle.

4. Cf. No. 25 below, A 400.

5. Presumably a reference to the principle of excluded middle, stated in the first sentence of the paper.

6. It is interesting that Leibniz rejected the notion of absolute time long before his controversy with the Newtonian Clarke.

7. John, 5:17 (New English Bible).

8. A use of the principle of sufficient reason. Another use is contained in the next paragraph: "there is no reason why. . . ."

9. An "interspersed" vacuum seems to be a vacuum between bodies (cf. A 493); a "great" vacuum seems to be an empty ultramundane space (see the next sentence) within which all bodies exist. On ultramundane (or "extramundane") space, cf. Clarke's third reply to Leibniz, May 1716, sec. 2 (GP VII, 368).

10. Compare Descartes, *Principia Philosophiae*, III, 48: the particles into which the world was divided were not at first spherical, but became spherical in the course of time.

23. Thought is not Motion

1. The date could have been added later.

2. Sc. when he perceives his own thought.

3. The argument seems to be as follows: granted that thought does not involve extension (which is something "most simple") it does not involve motion, of which extension is a part. Leibniz seems here to be taking the intensional approach to the proposition, saying in effect that the concept of motion includes the concept of extension.

4. This may appear to be a new argument; however, it can be related to the argument stated at the beginning of the paper if "thought which is free from symbols" is taken to be immediate perception.

24. On Existence

1. The editors of the Academy Edition point out that the handwriting resembles that of Nos. 20, 22, and 25, written in Dec. 1676.

2. Compare Leibniz's comments (Feb. 1676?) on a letter of Spinoza, A 282, n. 25; see also Introduction, Section 4, p. xxv.

3. A use of the principle of sufficient reason.

4. From the next sentence, it appears that Leibniz is thinking of the existence of things that are not necessary.

25. Notes on Metaphysics

1. Cf. No. 24 above, A 588: "There are ideas in it. . . ."

2. It is clear from the argument which follows that this is what Leibniz intended to say; what he actually wrote was the opposite of this. Cf. Grua, 266, n. 16.

3. Cf. No. 22, A 584.

4. In Leibniz's later philosophy, "second matter" (*materia secunda*) is a technical term: see, e.g., to Arnauld, 9 Oct. 1687 (GP II, 119). Here, however, the term seems not to have a technical sense; it seems simply to refer to the matter which surrounds the "first matter" of the body that is carried along by it.

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